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ABSTRACT

This resource manual is designed to assist vocational education teachers in Alberta in implementing each of the 20 courses that comprise the 16-level occupational component of the integrated occupational program. The manual contains specific information regarding: the goals of the integrated occupational program, course organization, cooperative planning, required/elective components, community partnerships, instructional strategies, and teacher support material. The guide first focuses on 10 concepts, skills and attitudes: introductory skills; organizational skills; communication skills; reading skills; writing skills; mathematical skills; visual skills; entrepreneurship; community partnerships; and work skills. The guide provides the goals to be accomplished in each of these areas and suggests methods of integrating these skills into vocational education courses. Activities are suggested for teaching each of the skills and attitudes. The second part of the guide provides teacher support material, such as lesson plans and learning activities, for courses in 20 areas of vocational education. (KC)

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INTEGRATED OCCUPATIONAL PROGRAM

Teacher Resource Manual

OCCUPATIONAL COMPONENT

16-LEVEL COURSES

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CURRICULUM

Alberta
EDUCATION

Teacher Resource Manual

Occupational Component

16-Level Courses

INTERIM – 1990

NOTE: This publication is a support document. The advice and direction offered is suggestive except where it duplicates or paraphrases the contents of the Program of Studies.

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INTRODUCTION

This *Teacher Resource Manual* (TRM) is designed to serve as a practical planning and instructional tool. It has been developed to assist teachers in implementing each of the twenty courses that comprise the 16-level occupational component of I.O.P.

The manual contains specific information regarding:

- goals of the Integrated Occupational Program
- course organization
- cooperative planning
- required/elective components
- community partnerships
- instructional strategies
- teacher support material.

GOALS OF THE INTEGRATED OCCUPATIONAL PROGRAM

The Integrated Occupational Program (I.O.P.) is designed to assist students who experience difficulty in the regular junior and senior high school program (Grades 8-12) and, subsequently, to provide students with a smooth transition to productive lives in the workplace. One key to achieving this transition successfully is the acquisition of a set of generic and occupation related work skills.

The Integrated Occupational Program is intended to provide students with the entry-level competencies, concepts, skills and attitudes, that will enable them to become good citizens and capable and reliable workers. The entry-level job skills students attain in the Integrated Occupational Program should be viewed as a starting point rather than the culmination of their education and training. As students gain on-the-job experience, they will be able to advance up a career ladder in their chosen career area.

The specific goals of the program are:

- to develop the essential concepts, skills and attitudes necessary for responsible participation in the home, the community and the workplace
- to provide learning opportunities that will enable students to experience success and achievement in order to enhance their self-esteem and independence
- to promote lifelong learning.

USING THE MANUAL

ORGANIZATION OF THE OCCUPATIONAL COURSES

The 16-level occupational component of the Integrated Occupational Program consists of 20 courses arranged in 8 clusters. (See I.O.P.: Occupational Component Overview, p. 4.)

Each course contains learning objectives through which students may develop generic concepts, skills and attitudes as outlined in the *Program of Studies/Curriculum Guide*. Additional occupation related learning objectives are stated in the scope and sequence chart provided for each of the 20 occupational courses (*Occupational Component 16-Level Courses, Program of Studies/Curriculum Guide*). These occupation related learning objectives are also addressed in the student workbooks which are available for each 16-level occupational course.

COOPERATIVE PLANNING

In schools where more than one teacher is responsible for providing instruction in the occupational component, cooperation among teachers for course delivery will ensure that students acquire the ability to transfer the concepts, skills and attitudes learned in one occupational course to other occupational courses, as well as in the core courses to each occupational course.

Teachers are encouraged to examine each course and its corresponding student workbook and teacher support material well in advance of instruction, to ensure that all necessary materials are obtained. The activities and suggestions provided within each course are numerous. **Advance planning should include a synthesis of effective strategies from the teacher's repertoire of personal experience, with suggestions from the manual considered most appropriate to individual student needs. Also, advance planning will enable teachers to integrate the teaching and learning of the generic concepts, skills and attitudes in the context of each work skill. The Planning Matrix (p. 7) may be used for this purpose. For example, as teachers prepare for instruction, the relationship of each generic skill/work skill may be identified and noted on the planning matrix.**

I.O.P. OCCUPATIONAL COMPONENT OVERVIEW

	Grade 10	Grade 11	Grade 12
Developmental Concept	Exploration	Orientation	Preparation
Primary Experiential Objective	To explore, reason, and experiment to discover skills related to clusters of occupations	To explore, experiment and practise skills related to one or more occupational area	To practise and develop entry-level skills in one or more occupational area
Suggested Instructional Orientation (a) School (b) Community Partnerships*	 80% 20%	 70% 30%	 60% 40%
Credits Per Course	(3-5 credits) 75-125 hours	(10 credits) 250 hours	(10 credits) 250 hours
Minimum Requirement	Four 3-credit courses Two 5-credit courses	Two course sequences	One course sequence
Evaluation	Attitude, Achievement, Competency	Attitude, Achievement, Increased Competency	Attitude, Achievement, Entry-Level Competency
AGRIBUSINESS			
1 Agricultural Mechanics	1 Exploration of terms, tools and techniques of basic carpentry, metalwork, welding and rope work	1 Orientation to arc welding, blueprint reading, small engine maintenance, painting	1 Preparation for employment and skill development in basic concrete work, electricity, forge work and soldering
2 Agricultural Production	2 Exploration of terms, tools and techniques related to land and soil products	2 Orientation to further land usage and animal production	2 Preparation for entry-level jobs. Further development of land/soil products, an increased emphasis on animal production
3 Horticultural Services	3 Exploration of terms, tools and techniques of lawn and garden care	3 Orientation to skill development in horticulture and basic floriculture	3 Preparation for employment in greenhouse care, gardening and floriculture
BUSINESS AND OFFICE OPERATIONS			
1 Business Services	1 Exploration of terms, tools and techniques related to jobs in sales, service and courier work	1 Orientation to retailing, cashier duties, keyboarding and telephone techniques	1 Preparation for employment and development of entry-level job skills in business services and sales
2 Office Services	2 Exploration of terms, tools and techniques related to office work and consumer awareness	2 Orientation to common office operations including keyboarding, filing, duplicating, mail handling and telephone techniques	2 Preparation for entry-level employment and further development of consumer awareness
CONSTRUCTION AND FABRICATION			
1 Building Services	1 Exploration of terms, tools and techniques related to sub-trade work including tool use and care; woodwork and fasteners	1 Orientation to framing, roofing, scaffold use and flooring	1 Preparation for helper roles or apprenticeship articulation. Additional skill options include painting, concrete work, bricklaying and glasswork
2 Construction Services	2 Exploration of terms, tools and techniques related to general piping, blueprint reading and tool use and care	2 Orientation to option areas including: heating, gas fitting, electrical, welding and insulation services	2 Preparation for helper roles or apprenticeship articulation in one of the trade areas

* The percentage figures given for the community partnership component are recommended minimal guidelines. Schools that do not have extensive on-site facilities will undoubtedly use community work sites to a much higher degree.

	Grade 10	Grade 11	Grade 12
Developmental Concept	Exploration	Orientation	Preparation
CREATIVE ARTS 1 Crafts and Arts	1 Exploration of terms, tools, materials and techniques of craft and art work	1 Orientation to skill development in specific crafts and arts	1 Preparation for entry-level employment and/or entrepreneurial activity in creative arts/cottage crafts industry
2 Technical Arts	2 Exploration of terms, tools, materials and techniques of graphic arts, media arts, photography and related arts	2 Orientation to skill development in one or more technical or related arts areas	2 Preparation for entry-level employment and/or entrepreneurial activity in one of the technical or related arts
NATURAL RESOURCES 1 Natural Resource Services	1 Exploration of terms, tools and techniques used by workers in three natural resource industries: (a) Oil and Gas (b) Forestry (c) Mining	1 Orientation to specific knowledge and skills related to one or more of three natural resource industries	1 Preparation for employment in one or more of the natural resource industries (a) Oil and Gas (b) Forestry (c) Mining
PERSONAL AND PUBLIC SERVICES 1 Child and Health Care Services	1 Exploration of services provided to children, the aged and the infirm	1 Orientation to principles of child care, baby-sitting, child safety, care of adults, home duties and basic nutrition	1 Preparation for employment as a day-care worker in day-care, residential aide, or nursing assistant
2 Esthetology	2 Exploration of terms, tools and grooming services used on face, feet and head	2 Orientation to facial shapes and care, eyebrow arching, false lash application, manicure and pedicure	2 Preparation for employment. Increased skill development and sales training
3 Fashion and Fabric Services	3 Exploration of garment care and cleaning, and the fashion merchandising fields	3 Orientation to fashion and fabrics. Basic skill development in repair and cleaning of clothes	3 Preparation for employment in fashion sales or laundry/cleaning operations
4 Hair Care	4 Exploration of terms, tools and treatments related to natural hair and wig care	4 Orientation to basic hair setting and styling, cutting, hair analysis and hair goods	4 Preparation for entry-level employment as beautician's assistant, wig dresser, or apprenticeship articulation
TOURISM AND HOSPITALITY 1 Commercial Food Preparation	1 Exploration of terms, tools and techniques of commercial food production	1 Orientation to basic food preparation, breakfast cookery and correct operations behaviour	1 Preparation for entry-level employment. Preparation of meats, vegetables, desserts and garnishes
2 Food Services	2 Exploration of terms, tools and techniques of serving food and beverages	2 Orientation to skill development, inside work, guest relations, sales and service	2 Preparation for entry-level employment as waiter, waitress, bus person, food service establishments worker
3 Maintenance and Hospitality Services	3 Exploration of terms, tools and techniques of building maintenance and hotel/motel support services	3 Orientation to carpet and upholstery care, floor care and special area maintenance	3 Preparation for entry-level employment as maintenance worker, security guard, houseman/chambermaid, bellhop or desk clerk
TRANSPORTATION 1 Automotive Services	1. Exploration of terms, tools and techniques of automotive care and maintenance	1 Orientation to engines and engine systems, tool and equipment care, replacement and mechanical services	1. Preparation for entry-level employment as automotive helper or apprenticeship articulation
2 Service Station Services	2 Exploration of terms, tools and techniques used in service station operations	2 Orientation to sales and service hoisting, lifting, wheels and tires, basic safety inspection	2 Preparation for entry-level employment as service station attendant and/or automotive helper
3 Warehouse Services	3 Exploration of terms, tools and techniques for warehousing, stock keeping and inventory management	3 Orientation to lifting, carrying, packing, boxing, wrapping, record keeping and receiving	3 Preparation for entry-level employment as warehouse worker, stock-keeper, assistant shipper or receiver

REQUIRED AND ELECTIVE COMPONENTS

The complement of I.O.P. occupational courses taken by students in Grade 10 should enable them to achieve both the generic learning objectives and the more job/career oriented learning objectives stated in the work skills scope and sequence chart provided for each occupational course outlined in the I.O.P. *Program of Studies/Curriculum Guide*. Teachers are required to provide opportunities for enrichment and remediation through the elective component of each course. The recommended time distribution for each component of the courses is:

COURSE COMPONENT	PERCENTAGE TIME ALLOCATION		
	Grade 10	Grade 11	Grade 12
Generic Learning Objectives	50	40	30
Work Skills Objectives	30	40	50
Elective Component	20	20	20

The elective component of each course may take the form of:

- enrichment activities
  - additional teacher developed student activities and job sheets
  - student initiated learning activities
  - additional community partnerships including mentorships, job shadowing, customer services and work site placements.

- remediation activities
  - alternative teacher developed activities and job sheets for students
  - reinforcement and review of specific, generic or job/career related concepts, skills and attitudes
  - additional community partnerships including mentorships, job shadowing, customer services, and work site placements.

I.O.P. SENIOR HIGH SCHOOL OCCUPATIONAL COURSE PLANNING MATRIX
INTEGRATING GENERIC SKILLS* WITH WORK SKILLS

COURSE: ______________	*CONCEPTS, SKILLS AND ATTITUDES																
	INTRODUCTORY SKILLS					ORGANIZATIONAL SKILLS					COMMUNICATION SKILLS	READING SKILLS	WRITING SKILLS	MATH SKILLS	VISUAL SKILLS	ENTRE-RENEUR-SHIP	COMMUNITY PARTNER-SHIP
WORK SKILLS	C.A.	J.S.	H.R.	S.E.	S.	E.	P.O.	TIM.	TAM.	W.S.							
e.g., Demonstrates safe and correct use of tools and equipment	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
e.g., identifies local suppliers	✓	✓	✓			✓	✓	✓	✓		✓	✓			✓		✓

C.A. – Career Awareness; J.S. – Job Search; H.R. – Human Relations; S.E. – Sanitation and the Environment; S. – Safety; E. – Ethics; P.O. – Planning and Organization; TIM. – Time Management; TAM. – Task Management; W.S. – Work Standards

DEVELOPING INTERPERSONAL SKILLS

The occupational courses offer many opportunities for enhancing students' interpersonal skills. Student activities performed in group settings may afford opportunities to address social interaction. A strategy for systematically analyzing a social problem is provided in the "Suggested Teaching Strategies" section of this manual ("SPOT": Social Problem-Solving Strategy). This strategy helps students to identify:

- reasons for the difficulty/conflict
- strategies that may help to avoid the difficulty/conflict another time.

Teacher modelling and student use of this strategy may improve the classroom climate, and enable students to gain confidence in their ability to interact effectively and communicate with one another.

DEVELOPING DECISION-MAKING AND PROBLEM-SOLVING SKILLS

Active participation of students is encouraged through the use of decision-making models as well as problem-solving strategies. A sample decision-making and problem-solving model is outlined in the *Program of Studies/Curriculum Guide*, and additional models are suggested in this document.

Additional strategies, designed to enhance students' thinking ability, are identified throughout the *Program of Studies/Curriculum Guide* and are included in this manual under "Suggested Teaching Strategies".

INSTRUCTIONAL LOCATION

Each occupational course is designed to be taught in partnership between the school and one or more related businesses or industries in a community. In-school demonstrations and presentations should be complemented with a variety of field experiences including field trips, job shadowing, work study or other suitable and approved arrangements. Whenever and wherever possible, students should be provided with opportunities to work and learn alongside representatives from the occupation cluster/course being taught.

In all courses, the generic component should be taught in school by a certified teacher. Where school facilities are lacking, the work skills may be taught through a community partnership arrangement with a teacher supervisor.

GENERIC SKILLS EVALUATION

The Generic Skills Evaluation Chart shown on pages 11-14, may be used to validate students' growth and development in an occupational course.

LEARNING RESOURCES

STUDENT RESOURCES

BASIC LEARNING RESOURCE

The resource listed below meets the majority of the goals and objectives identified in this curriculum:

Campbell, Richard and Mary J. Thompson, et al. *Working: Today and Tomorrow*: Canadian Edition. Toronto, Ontario: Irwin Publishing, 1990.

Working: Today and Tomorrow provides for the focused development of the generic concepts, skills and attitudes identified in the Grade 10 Program of Studies. It is intended that appropriate sections of the text be used throughout the sequence of each occupational course, Grades 10-12.

SUPPORT LEARNING RESOURCES

A student workbook is available for each occupational course. The workbook related to each 16-level occupational course provides students with information, exercises, and job sheets that follow the scope and sequence of skill development identified in the Work Skills Profile contained in each student workbook.

The specific activities and projects contained in the workbooks are not meant to be prescriptive or exhaustive; rather, they may provide points on which to focus the development of specific learning related to an occupational cluster.

Teachers are encouraged to complement and supplement the material contained in student workbooks to meet individual student's needs.

TEACHER RESOURCE

The teacher resource listed below is designed to support the instructional use of the basic learning resources:

The *Teacher Resource Manual* (1990) for I.O.P. 16-level occupational courses developed by Alberta Education contains strategies and suggested student activities intended to structure and support:

- development of the concepts, skills and attitudes as outlined in the Program of Studies
- development of life and work skills
- delivery of instruction in each occupational course.

Other learning resources listed in the teacher support material in this document have been identified as potentially useful for integrating instruction of the generic concepts with the work skills. Except where designated, these titles have not been evaluated by Alberta Education and their listing is not to be construed as an explicit or implicit departmental approval for use. These titles are provided as a service only to assist local jurisdictions to identify resources that contain potentially useful ideas for teachers. The responsibility of evaluating these resources before making a selection rests with the local jurisdiction according to local policy.

ACCESS NETWORK

ACCESS offers a variety of resources and services to teachers. For a nominal dubbing and tape fee, teachers may have ACCESS audio and video library tapes copied. ACCESS also offers a service called "Night Owl Dubbing". This allows educators to tape late night educational programs directly from their own televisions.

ACCESS publishes both an *Audio-Visual Catalogue* and a comprehensive schedule of programming, available on request.

For additional information, contact ACCESS NETWORK, Media Resource Centre, 295 Midpark Way S.E., Calgary, Alberta, T2X 2A8 (from outside of Calgary, telephone toll free, 1-800-352-8293; in Calgary, telephone 256-1100).

REGIONAL RESOURCE LIBRARIES

Films and videos are available for loan through the five centres listed below. In some instances, computer software is also loaned. Catalogues of holdings are available upon request.

Zone I
Peace River Regional
c/o Peace River School Division No. 10
P.O. Box 988
Peace River, Alberta
T0H 2X0
Telephone: 624-3187

Zones II and III
Central Alberta Media Service
c/o Sherwood Park Catholic Separate School District
2017 Brentwood Boulevard
Sherwood Park, Alberta
T8A 0X2
Telephone: 464-5540

Zone IV
Alberta Central Regional Education Services
County of Lacombe No. 14
Bag Service 108
Lacombe, Alberta
T0C 1S0
Telephone: 782-6601

Zone V
South Central Alberta Film Federation
County of Wheatland No. 16
Box 90
Strathmore, Alberta
T0J 3H0
Telephone: 934-5028

Zone VI
Southern Alberta Regional Film Centre
c/o McNally School
P.O. Box 845
Lethbridge, Alberta
T1J 3Z8
Telephone: 320-7807

GENERIC SKILLS EVALUATION CHART
GRADE 10 OCCUPATIONAL COURSES

Student's Name ____________________

Course Name ______________________

Instructor's Validation

INTRODUCTORY SKILLS	Awareness	Use	Mastery	Other
1. Recognizes nature of occupational cluster.				
2. Identifies variety of occupations in the occupational cluster.				
3. Identifies the concepts, skills and attitudes required in the occupational cluster.				
4. Recognizes potential career ladders.				
5. Identifies personal interests.				
6. Recognizes language of the occupational cluster.				
7. Recognizes job opportunities.				
8. Identifies job search as a process.				
9. Identifies personal career goals.				
10. Identifies job requirements.				
11. Identifies personal abilities.				
12. Recognizes components of human relations.				
13. Maintains good peer relationships.				
14. Relates well to others.				
15. Defines "hygiene" and "sanitation".				
16. Identifies health and safety standards.				
17. Maintains sanitary work area.				

Instructor's Validation

INTRODUCTORY SKILLS (cont'd)	Awareness	Use	Mastery	Other
18. Defines "safety".				
19. Practises fire safety.				
20. Describes first aid practices.				
21. Recognizes need for safety in the workplace.				
ORGANIZATIONAL SKILLS				
22. Defines "ethical behaviour".				
23. Recognizes ethics/human relations relationship.				
24. Demonstrates willingness to participate.				
25. Demonstrates good attendance/punctuality.				
26. Defines "planning" and "organizing".				
27. Identifies components/sequence of task.				
28. Defines "time management".				
29. Demonstrates dependability.				
30. Defines "task management".				
31. Demonstrates willingness to learn.				
32. Demonstrates interest in area.				
33. Defines work standards.				
34. Identifies job-specific standards.				

	Instructor's Validation			
COMMUNICATION SKILLS	**Awareness**	**Use**	**Mastery**	**Other**
35. Defines "communication".				
36. Identifies forms of communication.				
37. Recognizes forms of verbal and non-verbal communication.				
38. Follows verbal instructions.				
39. Asks questions.				
40. Recognizes occupation related communication techniques.				
READING SKILLS				
41. Identifies resource centre.				
42. Recognizes the variety of available resources.				
43. Follows written instructions.				
44. Locates references.				
WRITING SKILLS				
45. Writes simple sentences.				
46. Recognizes need for basic writing skills.				
47. Completes simple forms.				

	Instructor's Validation			
MATHEMATICAL SKILLS	**Awareness**	**Use**	**Mastery**	**Other**
48. Reads numbers to six digits.				
49. Applies four basic mathematics functions.				
50. Uses metric and non-metric units of measurement.				
VISUAL SKILLS				
51. Identifies occupation related symbols.				
52. Reads charts and graphs.				
53. Demonstrates creativity.				
ENTREPRENEURSHIP				
54. Defines "entrepreneurship".				
55. Identifies small businesses in the community.				
56. Recognizes entrepreneurship as a potential career path.				
COMMUNITY PARTNERSHIPS				
57. Demonstrates willingness to participate in field experiences.				
58. Demonstrates satisfactory behaviour during community partnerships.				

I.O.P. OCCUPATIONAL COMPONENT, GRADES 10-12
A MATRIX OF OCCUPATIONAL CLUSTERS, COURSES AND GENERIC SKILLS*

OCCUPATIONAL CLUSTER	OCCUPATIONAL COURSE	*CONCEPTS, SKILLS AND ATTITUDES																	
		INTRODUCTORY SKILLS					ORGANIZATIONAL SKILLS					COMMUNICATION SKILLS	READING SKILLS	WRITING SKILLS	MATH SKILLS	VISUAL SKILLS	ENTREPRENEURSHIP	COMMUNITY PARTNERSHIPS	WORK SKILLS
		C.A.	J.S.	H.R.	S.E.	S.	E.	P.O.	TIM.	TAM.	W.S.								
AGRIBUSINESS	Agricultural Mechanics	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Agricultural Production	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Horticultural Services	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
BUSINESS AND OFFICE OPERATIONS	Business Services	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Office Services	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CONSTRUCTION AND FABRICATION	Building Services	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Construction Services	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CREATIVE ARTS	Crafts and Arts	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Technical Arts	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
NATURAL RESOURCES	Natural Resource Services	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
PERSONAL AND PUBLIC SERVICES	Child & Health Care Services	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Esthetology	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Fashion and Fabric Services	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Hair Care	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
TOURISM AND HOSPITALITY	Commercial Food Prep	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Food Services	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Maintenance & Hosp. Serv.	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
TRANSPORTATION	Automotive Services	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Service Station Services	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Warehouse Services	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

C.A. – Career Awareness; J.S. – Job Search; H.R. – Human Relations; S.E. – Sanitation and the Environment; S. – Safety; E. – Ethics; P.O. – Planning and Organization; TIM. – Time Management; TAM. – Task Management; W.S. – Work Standards

CONCEPTS, SKILLS AND ATTITUDES

The *Occupational Component 16-Level Courses, Program of Studies/Curriculum Guide* consists of ten generic components.

Generic components (concepts, skills and attitudes) include:

1. Introductory Skills
2. Organizational Skills
3. Communication Skills
4. Reading Skills
5. Writing Skills
6. Mathematical Skills
7. Visual Skills
8. Entrepreneurship
9. Community Partnerships
10. Work Skills

The generic components of the curriculum are common to each of the occupational courses. They represent the concepts, skills and attitudes students acquire which are transferable to and applicable in the home, the school, the community and the workplace.

The generic concepts, skills and attitudes presented in this manual correspond to those contained in the *Program of Studies/Curriculum Guide*. They should be taught and reinforced within the context of each occupational course. The relationships between the eight occupational clusters, twenty occupational courses and the generic concepts, skills and attitudes are outlined in the following chart.

Component 10, Work Skills, consists of both generic and elective learning objectives. The elective learning objectives are specific to each occupational course and are outlined in the *Occupational Component 16-Level Courses, Program of Studies/Curriculum Guide* Scope and Sequence Charts, pp. 129-270.

1. INTRODUCTORY SKILLS

The introductory skills include:

A. Career Awareness

B. Job Search Skills

C. Human Relations

D. Sanitation and the Environment

E. Safety.

The introductory skills are common to all occupational courses. At the Grade 10 level their purpose is to provide students with the opportunity to explore related jobs in families.

Teachers are encouraged to be flexible in their sequencing of the introductory skills. Rather than presenting the introductory concepts and skills from a purely theoretical perspective, their presentation as an integrated part of one or more of the work skills will help to give them meaning and more relevance.

RESOURCES

STUDENT RESOURCE

- *Working: Today and Tomorrow*, Canadian Edition. Toronto, Ontario: Irwin Publishing, 1990.

Correlation of Learning Objectives with Student Resource

Concepts, Skills and Attitudes	*Working: Today and Tomorrow*
1. Introductory Skills	
A. Career Awareness	Chapter 1, Appendix
B. Job Search Skills	Chapter 7
C. Human Relations	Chapter 10 "The Importance of Attitude"
D. Sanitation and the Environment	Chapter 11 "Preventing Accidents and Illnesses"
E. Safety	Chapter 11

TEACHER RESOURCES

- Resource 1, "Career Opportunities Interview Guide"
- Resource 2, "Personal Interests and Abilities Inventory"
- Resource 3, "Job Survey Chart"

- Resource 4, "Ability Inventory"
- Resource 5, "Personal Hygiene Practices"
- Resource 6, "Province of Alberta: Information on Occupational Health and Safety Regulations"
- Resource 7, "The Law Governing Occupational Health and Safety in Alberta"
- Resource 8, "Rights and Obligations of Employees and Employers"
- Resource 9, "Public Hygiene Practices"
- Resource 10, "Safety Procedures and Regulations"
- Resource 11, "The Accident Sequence"
- Resource 12, "Kinds of Fire Extinguishers"
- Resource 13, "Emergency Procedures Chart"
- Alberta Career Development and Employment publications
  - *Occupational Profiles*
  - *The Easy-to-Read Career Planning Guide*
  - *The School-Work Connection*
- Business and trade journals
- *Canadian Classification and Dictionary of Occupations (CCDO)*, Employment and Immigration Canada, Occupational and Career Analysis and Development Branch
- Careers Canada Services, Employment and Immigration Canada
- Career Selector series, Ontario Ministry of Labour, Women's Bureau
- Careers, Provincial Series, Employment and Immigration Canada
- Student Workbooks
- School and Public Health nurses
- Telephone and business directories
- Workers' Compensation Board officials and publications
- Community partners.

A. CAREER AWARENESS

The purpose of this introductory skill is to enable students to establish a context for the knowledge, skills and attitudes that will be developed throughout each occupational course in the Integrated Occupational Program.

Establishing the occupational context is important if subsequent learnings are to be meaningful to students.

The concepts, skills and attitudes related to career awareness developed at the Grade 10 level include:

1. Recognizes the nature of the occupational cluster.
2. Identifies the variety of occupations in the occupational cluster.
3. Identifies the concepts, skills and attitudes required in the occupational cluster.
4. Recognizes potential career ladders.
5. Identifies personal interests.

1. THE NATURE OF THE OCCUPATIONAL CLUSTER

Each industry/business within an occupational cluster has distinctive characteristics. These include:

- geographic location
- trends: markets, seasons, long-term prospects
- labour intensity
- working environment
- entrepreneurial opportunities
- wage range
- how money is earned: wage, salary, commission.

Suggested Activities/Community Partnerships

1. a. Using local telephone and business directories, newspapers and other media and observational skills, identify the local businesses and industries that relate to the occupational cluster.

   b. Identify one local business and one local industry that relate to the course.

2. Discuss:
   - Which local business/industry employs the most people?
   - Does this business/industry provide opportunities for:
     - year round employment?
     - seasonal employment?

  - part-time employment?
  - entrepreneurial activities?

3. Interview people in related businesses/industries and record details about wages, working conditions and prospects in the area.

2. VARIETY OF OCCUPATIONS

The concept of the variety of job and career opportunities within each occupational cluster should be introduced early in each occupational course and further developed as each new concept, skill and attitude is introduced.

It is important for students to realize that their learning experiences in the program will provide them with the ability to access a range of job and career opportunities within each occupational cluster.

Suggested Activities/Community Partnerships

1. a. Brainstorm to identify the eight occupational clusters that represent the major fields of employment in Alberta.

   b. To which occupational cluster does this course relate?

   c. Brainstorm to identify and record the variety of occupations that relate to this occupational cluster and this occupational course. (See Suggested Teaching Strategies, "Brainstorming", page 259.)

2. a. Which occupations are of most interest to you? Why?

   b. Draw a chart or web to show the relationship between the jobs that most interest you and:
      - the occupational cluster
      - the occupational course.

3. Invite a representative from the local Career Development and Employment Office to discuss local and provincial job and career opportunities in course related occupations.

3. REQUIRED CONCEPTS, SKILLS AND ATTITUDES

Each occupational cluster in the Integrated Occupational Program covers a broad spectrum of jobs and career opportunities.

Students adopting this concept will be able to see job relationships within and between major occupational clusters.

Suggested Activities/Community Partnerships

1. Discuss:
   - What are the entry-level requirements in this occupational area?
   - What general technical knowledge is required?
   - What general practical skills are required?
   - Is a driver's licence necessary?

- **Is a defensive driving certificate necessary?**
- **Is physical fitness (toughness, strength, stamina) a requirement?**
- **Would fear of heights or enclosed spaces be a handicap to employment?**
- **Is shift work a requirement?**

2. **Encourage students to identify specific concepts, skills, attitudes and other factors that relate to employability in specific jobs related to the occupational cluster and occupational course.**

3. a. Have students locate sources of information on the characteristics of related industry/business.

   b. Have students work in teams to gather information on:
      - a specific characteristic
      - characteristics in specific jobs.

4. CAREER LADDERS

The concept of a career ladder is important to all students. It is especially important to students in the Integrated Occupational Program. **The identification of possible career ladders will assist students to identify and build hopes and goals for the future.**

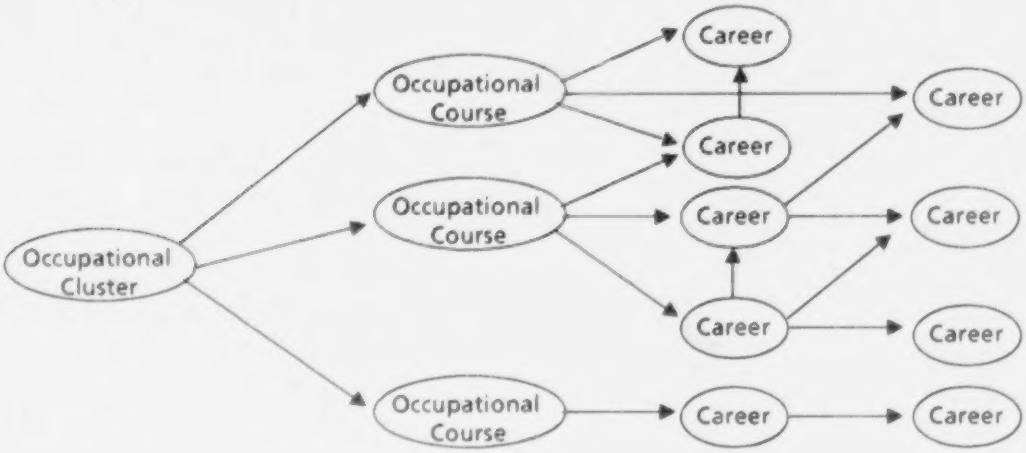
While one of the goals of the Integrated Occupational Program is to enable students to develop at least entry-level employability skills, it is important that they also develop a sense of direction to assist them to:

- identify their potential, and the possibilities for advancement, further education and training
- identify appropriate apprenticeship-training articulation routes
- identify realistic career progressions
- identify opportunities for further education and training
- identify government support and allowances available for both training and upgrading in different occupations and in different regions of the province.

Suggested Activities/Community Partnerships

1. Select two different career areas that relate to the course, and interview or job shadow a business/industry owner, operator or manager in each career area in the community. Use Resource 1, "Career Opportunities Interview Guide" to record each person's responses along with your observations.

2. Draw a chart or web to show the relationship between this course and related courses, the occupational cluster to which they relate, and potential career ladders.
   e.g.,


Occupational Cluster
Occupational Course
Occupational Course
Occupational Course
Career
Career
Career
Career
Career
Career
Career
Career
Career
Career

3. a. Attend a career fair and record information about each of the career areas that interest you.

   b. Which of the careers are directly related to this course?

   c. Will the things you learn in this course help you to enter this career?

   d. What other abilities will you need to develop to climb this career ladder?

5. PERSONAL INTERESTS

Students need to be assisted in the identification of their personal interests. The important question they must ask themselves is: What do I like to do?

Students should be able to differentiate between personal interests and personal abilities. It is important for teachers to reinforce the more positive interests expressed by students rather than to criticize them for expressing negative interests.

Suggested Activities/Community Partnerships

1. Using brainstorming, listing, or some other informal information gathering strategy, identify and record your personal interests. (See Suggested Teaching Strategies, "Brainstorming".)

2. a. Identify and record your personal interests, the things you like to do. (Use Resource 2, "Personal Interests and Abilities Inventory".)

   b. Which of your personal interests relates to the things you are learning in this course?

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B. JOB SEARCH SKILLS

The ability of students to recognize that job search is a process and not an event is an important skill for graduates from the Integrated Occupational Program.

One of the primary goals of the Integrated Occupational Program is to develop students' ability to attain and retain employment. The concept of job search and the development of related skills is an integral part of each occupational course.

Job search skills developed at the Grade 10 level include:

1. Recognizes language of the occupational cluster.
2. Recognizes job opportunities.
3. Identifies the job search process.
4. Identifies personal career goals.
5. Identifies job requirements.
6. Identifies personal abilities.

1. LANGUAGE OF THE OCCUPATIONAL CLUSTER

Each job, trade, business, industry within an occupational cluster has its own language. Identification and practical use of the appropriate language of business and industry can assist students to gain:

- **easier admittance to the work force**
- **acceptance in the workplace**
- **a sense of identity and belonging to a group.**

The incremental achievement of each of these "gains" during the full sequence of an occupational course will assist students to make a smooth transition from school to the workplace.

Suggested Activities/Community Partnerships

1. Define the following terms:
    - unskilled worker
    - semi-skilled worker
    - apprentice
    - entry-level skills.
2. Job shadow one or more persons in a related business or industry and make a list of the terms that are commonly used "on-the-job".

3. Using a variety of in-school and community resources, identify and describe related occupations; e.g.,
   - esthetologist
   - horticultural assistant
   - leasehand
   - derrickhand.

2. JOB OPPORTUNITIES

The ability of students to identify the existing and potential opportunities for employment and entrepreneurship are important parts of their goal setting process.

Students need to be aware of local, regional, provincial and national trends within each occupational cluster.

Suggested Activities/Community Partnerships

1. a. Visit the library and obtain related industry and business reports.

   b. Identify job opportunities on a local, regional, provincial or national map.

2. Discuss:

   a. What changes may occur in the occupational cluster in five years? ten years?

   b. What may be the effect of these changes on
      - employment opportunities?
      - entry-level requirements?
      - further education?
      - retraining?
      - moving from the community?

3. JOB SEARCH PROCESS

It is essential that students become aware that the search for employment is a process rather than an event.

At the Grade 10 level, it may be sufficient for students simply to identify the parts of the process and, in subsequent courses, develop competence and confidence in practising their job search skills.

Suggested Activities/Community Partnerships

1. Discuss:

   a. What do we mean when we say, "job search is a process not an event"?

   b. In the context of job search, what is the meaning of the terms: "event" and "process"?

2. a. Brainstorm the major steps in the job search process.

   b. Place the steps in order of usual occurrence.

   c. Discuss: "Are there alternative ways of ordering these steps?"

3. One way of ordering the steps in the job search process is shown below. If you were going to apply for a job now, what changes would you make to the order of the steps?
   - identifying personal interests
   - identifying personal strengths
   - matching interests and abilities
   - deciding what is wanted from work
   - identifying job opportunities
   - obtaining and completing applications
   - identifying "hidden job" market
   - writing a résumé
   - writing a covering letter
   - participating in a job interview
   - accepting a job
   - keeping a job.

4. PERSONAL CAREER GOALS

Having previously identified the nature of jobs within the occupational cluster and their personal interests, it may now be appropriate for students to identify their personal goals. Identifying realistic career goals can provide the direction to and motivation for learning.

Suggested Activities/Community Partnerships

1 Respond to the following questions:
   - Do you want to work indoors?
   - Do you want to work outdoors?
   - Do you want to do shift work?
   - Do you have the physical ability needed?
   - Do you want to work out of town?
   - Do you want opportunities for further learning?
   - Do you know the average rate of pay for specific jobs?

Note:

a. It is a useful student learning experience to pose these questions twice during the course. By comparing early and later responses, students may be better able to see how their goals change over time.

b. Similarly, discussions on first and second period responses may help to reinforce the notion that school provides useful learning opportunities.

5. JOB REQUIREMENTS

Each occupational course within the Integrated Occupational Program is designed to provide students, at the end of their Grade 12 year, with knowledge, skills and attitudes appropriate for at least entry-level employment in a family of related jobs. It is, however, necessary for students to be able to identify job-specific requirements.

Knowledge of job-specific requirements will help students to:

- **identify jobs of specific interest**
- **identify personal strengths and weaknesses in relation to specific jobs**
- **establish goal directed learning patterns.**

The School-Work Connection is a booklet available from Career Services Branch, Alberta Career Development and Employment. Among many related topics, the following advice is provided to students seeking to understand the workplace:

- Understand that the kinds of work that entry-level employees do may be limited
- Display interest, initiative and willingness to learn: job advancement will follow
- Understand the similarities between work and school: grades versus pay
- Understand the differences between work and school: attendance, punctuality, attitudes
- Know that each job and each workplace has an "unwritten code" of employee standards
  - Identify acceptable workplace behaviour
  - Identify acceptable workplace language
  - Identify acceptable workplace dress.

Suggested Activities/Community Partnerships

1. a. List the different jobs that graduates from a 16, 26, 36 occupational course sequence of this course may obtain.

   b. Discuss and record answers to each of the following questions:
      - What work do people in this kind of employment actually do?
      - What are the entry-level skill requirements?
      - Is previous work experience a requirement?
      - What is the average wage?
      - Is the job seasonal?
      - What are the hours of work?
      - Are personal tools a requirement?

2. Invite parents and others to make presentations on specific job requirements.

3. Arrange to visit and interview people working in jobs that interest you. Use a copy of Resource 3, "Job Survey Chart" to record your answers and your observations.

6. PERSONAL ABILITIES

Students should have previously identified their personal interests. They should be encouraged to recognize the difference between personal interests and personal abilities.

Suggested Activities/Community Partnerships

1. Ask yourself the following questions:
    - What do I do well?
    - Are there job opportunities related to my present abilities?
    - What further education, training is required for job entry?
2. Use Resource 4, "Ability Inventory" to record and summarize your abilities.
3. After interviewing people in the workplace:
    a. Draw a matrix to show the abilities (knowledge, skills, attitudes) required in jobs that relate to the course.
    b. Circle the abilities that you now possess.
    c. Underline the abilities you hope to possess when you graduate e.g.,

RELATED JOBS	ABILITIES		
	KNOWLEDGE	SKILLS	ATTITUDES
1. Forest Crew Worker	types of trees	planting trees	getting along with others
2. Leasehand			
3. Derrickhand			
4. etc.			

4. Discuss:
    a. Do you think that your interests and abilities will change by the time you graduate? Explain your answer.
    b. Have your interests and abilities changed since you were in Grade 8? In what ways?

C. HUMAN RELATIONS

The concept of human relations and its related skills and attitudes reinforce related concepts, skills and attitudes developed in Grades 8 and 9, and expand the notion of interpersonal relationships to include human relations in the workplace. **The ability of students to develop and maintain good relationships with peers and others is an integral part of each senior high school I.O.P. occupational course and sequence of courses.**

The human relations concepts, skills and attitudes developed at the Grade 10 level include:

1. Recognizes the meaning of human relations.
2. Maintains good peer relationships.
3. Relates well to others.

1. HUMAN RELATIONS

Human relations is a concept that relates to the way people communicate with each other.

Various elements determine the quality of human relationships. Both in school and in the workplace the following factors influence how people relate to one another:

- attitudes
- personalities
- verbal communications
- non-verbal communications
- health, grooming, appearance
- practice of work ethics.

The influence of each factor may vary, dependent upon time, place and people.

Suggested Activities/Community Partnerships

1. Brainstorm to identify the characteristics of good human relations:
   - in the home
   - in school
   - in various workplaces.
2. Observe and list examples of effective human relations strategies in school and in the workplace.
3. Using your own experiences, describe an example of:
   - good human relations
   - poor human relations.
4. Invite community partners to participate in a panel discussion dealing with the importance of human relations in the workplace.

2. RELATING TO PEERS

Relationships with peers can be fostered by providing, or having students create, a work environment that is conducive to good interpersonal relationships.

Relationship building should be started on the first day of the course. "Icebreaking" and "climate building" activities may include:

- self-introductions by students
- introductions by other students
- occupational area role playing/charades.

Research indicates that students' first impressions of the teacher, their peers, and the course content affects their future performance as a class member or as a class drop-out. **The development of positive peer relationships as well as teacher relationships is an integral part of every course in the Integrated Occupational Program.**

Suggested Activities/Community Partnerships

1. Discuss: "What can we do to improve the relationships between students in this course?"

2. Where appropriate:
   - individualize your work area
   - decorate the classroom walls with photographs, collages and other displays related to the occupational cluster
   - invite parents and friends to visit the classroom and to participate in various activities.

3. RELATING TO OTHERS

As with the development of peer relationships, the fostering of good relationships with others should be an ongoing process.

As appropriate, allow your classroom to have an open door policy.

Suggested Activities/Community Partnerships

1. a. Invite parents, teachers, community members into your work area

   b. Display your work in school and, where appropriate, in the community.

2. Building good relationships with prospective employers may lead to part-time jobs or full time employment upon graduation. What are some of the ways in which good relationships with community partners may be developed?

D. SANITATION AND THE ENVIRONMENT

The concept of "sanitation and the environment" as used in occupational courses relates to the personal-public, individual-group responsibilities for maintaining clean and healthy conditions in the workplace and in the environment in general.

Health and safety in the workplace are usually linked together. However, in order to provide additional emphasis to both, each is addressed as a separate concept in the generic skills profile.

The maintenance of sanitary work areas and work environments is an essential work skill in all occupations.

The concepts, skills and attitudes related to sanitation and the environment developed in this unit include:

1. Defines "hygiene" and "sanitation".
2. Describes "personal hygiene" and "public hygiene".
3. Identifies related health and sanitation standards.
4. Maintains sanitary work area.

1. HYGIENE AND SANITATION DEFINED

Hygiene refers to keeping things clean and maintaining health. Sanitation refers to the practices used to maintain hygienic conditions.

In this province, Alberta Occupational Health and Safety has the responsibility of safeguarding the health of workers and others. Inspectors from the ministry are responsible for ensuring that workers are protected and that the workplace and the environment are maintained in a safe manner. Inspectors monitor:

- workers' health
- workplace and work area hygiene
- equipment, tool and chemical use
- work practices.

Inspectors also have the right to visit any work site to assess the working conditions and the effects of any work on the surrounding environment.

Suggested Activities/Community Partnerships

1. Invite community partners (e.g., school nurse, business operator, Community and Occupational Health officials) to discuss:
   - the importance of health and sanitation in the workplace
   - the measures taken to protect the health of people in the workplace.
2. Brainstorm: What measures are taken to promote health and sanitation:
   - in your home?
   - in the school?

2. PERSONAL AND PUBLIC HYGIENE

Personal hygiene refers to practices performed by individuals to maintain health and cleanliness. These practices are important because they influence a person's:

- ability to perform necessary work skills
- ability to work with others
- employability.

Personal hygiene practices include:

- daily bathing
- using appropriate deodorant or anti-perspirant
- good eating habits
- regular exercise
- regular medical, dental and optical check-ups
- regular washing/laundering of clothes
- maintaining good mental health.

Public hygiene refers to practices regulated or performed by governments to protect people's health and the environment. These practices affect everyone in society and include:

- health and safety regulations
- hazardous and waste material handling, storage and disposal.

Suggested Activities/Community Partnerships

1. Discuss:

   a. What are the possible consequences of unhygienic personal behaviours?

   b. What are the possible consequences of unhygienic public practices?

   c. What is the possible relationship between poor personal hygiene and human relations in the workplace?

2. List an appropriate daily, weekly sequence for personal hygiene practices as they may relate to this occupational area.

3. a. In some occupations (e.g., child and health care, food preparation and service) strict personal and public hygiene practices are regulated. Using Resource 5, "Personal Hygiene Practices", visit three businesses/industries that relate to the course, and record your observations of regulated personal hygiene practices.

   b. Compare your observations with those recorded by classmates.

   c. Make a list of the personal hygiene practices that are regulated in each occupation related to the course.

3. HEALTH AND SAFETY STANDARDS

Every employer establishes standards for workers. These standards include PERFORMANCE, PRODUCTIVITY, HEALTH and SAFETY, and may vary even among similar jobs.

In addition to employer-made standards, workers in Alberta are protected through standards enforced by various departments of the Alberta government. Each government department gets its authority from different legislation — acts and codes passed by the government. (See Resource 6, "Province of Alberta: Information on Occupational Health and Safety Regulations" and Resource 7, "The Law Governing Occupational Health and Safety in Alberta".)

Acts and codes that directly affect workers include:

- Occupational Health and Safety Act
- Alberta Employment Standards Code.

Students may be interested in information that relates to Resource 8, "Alberta Employment Standards Code". Topics in this code include statements on:

- minimum wages
- age of employee
- hours of work and overtime
- vacation entitlements
- holidays
- maternity leave
- termination procedures
- working conditions.

Suggested Activities/Community Partnerships

1. Invite community partners to participate in a panel discussion on work standards. Participants may include:
    - small business operator
    - manager from a local industry
    - labour union representative
    - Occupational Health and Safety office.
2. Use the "PMI" strategy to explore the appropriateness of different work standards. (See Suggested Teaching strategies, "PMI".)
3. Read Resource 8, "Rights and Obligations of Employees and Employers" and use the "RAP" strategy to put the information in your own words. (See Suggested Teaching Strategies, "RAP".)

4. WORK AREA SANITATION

Maintaining sanitation in one's own work area is important, in school and in the workplace.

Work area sanitation is part of the work area management process.

4

A sanitary work area is:

- a safe work area
- a pleasing work area
- attractive to others
- essential to production.

In specific occupational environments, the concept of work area sanitation needs to be addressed in detail; e.g., child and health care; hair care; esthetology; commercial food production; among others. (Sanitation is addressed in detail in the work skills profile for each occupational course.)

Students should be made aware that failure to maintain the work area and the work tools to provincial standards can result in the business or work area being closed until sanitary standards are met. Similarly, failure to maintain the tools and working environment to an employer's standards may result in loss of job for the offending worker.

The Alberta Health Act and the Provincial Board of Health Regulations provide separate regulations to govern each type of business.

Suggested Activities/Community Partnerships

1. The Alberta government is responsible for occupational health and safety in the province. To familiarize yourself with occupation related regulations:

    a. Obtain and read a copy or summary of the occupational health and safety regulations that relate to the course.

    b. Invite community partners from the local agencies to discuss occupational health and safety standards and practices with the class, e.g.,
        - local hospital or public health unit
        - provincial Occupational Health and Safety Board
        - Workers' Compensation Board.

2. a. Visit three similar workplaces and observe public hygiene practices. Use Resource 9, "Public Hygiene Practices" to keep a record of the practices you observe. Compare these with the records made by classmates and discuss:
        - What were the major differences in the public hygiene practices observed in the three workplaces?
        - Why are public hygiene practices more carefully performed in some work sites than in the others? Where? What effect might this have on the operation?

3. Make a list of the practices that you use to keep a sanitary work area:
    - in school
    - in the workplace.

E. SAFETY

The knowledge, skills and attitudes related to safety are addressed within each occupational course and are dealt with both as a generic concept and a specific work skill.

Safety is not just an entry-level work skill. Work skills are either safe or they are unsafe, and the consequences of unsafe practices can be disastrous both to self and to others.

Students should receive instruction in the safe handling of tools, equipment and supply use and general safe practices both in the school lab and in the workplace. These instructions should be reinforced through theory and practice throughout the course. (See Suggested Teaching Strategies, "CARE".)

The concepts, skills and attitudes related to safety in the workplace developed at the Grade 10 level include:

1. Defines "safety".
2. Practises fire safety.
3. Recognizes need for safety in the workplace.

RESOURCES

- Alberta Labour publications
  - Heating Boiler Safety (Pamphlet, 1985)
  - Reporting Accidents (Form, 1985)
  - Help Yourself to Electrical Safety in Industry (Brochure, 1981)
  - Help Yourself to Electrical Safety on the Farm (Brochure, 1985)
  - Baby-sitter! You are Responsible! (Card)
  - Emergency Fire Information (Booklet, 1985)
  - Know Your Fire Extinguishers (Cards)

- Armour, Margaret-Ann, et al. *Potentially Carcinogenic Chemicals: Information and Disposal Guide*. University of Alberta and Cross Cancer Institute. Distributed by Terochem Scientific, Box 8188, Station F, Edmonton, AB, T6H 2P1.

- Armour, Margaret-Ann et al. *Hazardous Chemicals: Information and Disposal Guide*. University of Alberta. Distributed by Terochem Scientific, Box 8188, Station F, Edmonton, AB, T6H 2P1.

1. SAFETY DEFINED

Safety is as much a state of mind as it is a set of safe practices. Students should be encouraged not to think of safety as a set of extra tasks that they have to do. Rather, safety practices should be taught and learned as part of the normal skill development process.

Safety in the school lab and in the workplace is everyone's business. An unsafe act by one person can affect the health and welfare of many others.

Resource 10, "Safety Procedures and Regulations" can be adapted for use in any lab or workplace.

Suggested Activities/Community Partnerships

1. a. Practise safe use of tools, safe behaviour, and emergency responses to safety hazards.

   b. Complete a safety unit that includes the signing of a safety pledge form. (See Student Workbook.)

2. Use Resource 11, "The Accident Sequence" to reinforce procedures used to prevent accidents.

2. FIRE SAFETY

As a component of the introductory safety unit of instruction, ensure that students are aware of school fire safety procedures:

- closest exits
- reporting procedures
- consequences of misuse of fire bells/signals and fire extinguishers
- student responsibilities for use of fire extinguishers.

Suggested Activities/Community Partnerships

1. Proper procedures for handling a fire extinguisher may be learned by:
   - identifying different types of fire extinguishers (See Resource 12, "Kinds of Fire Extinguishers".)
   - visiting a fire station.

3. SAFETY IN THE WORKPLACE

This concept and related skills is addressed in the work skills profile and in the student workbook available for each occupational course.

Instruction in general safety practices should be integrated with correct use of equipment, tools, and supplies through each work skill. Similarly, the instruction should ensure that students are able to identify unsafe conditions in the lab or in the workplace.

Instruction in basic first aid should be provided to each student by a certified first aid trainer.

To ensure safety in the workplace, employees should be:

- well trained
- safety conscious
- able to recognize unsafe conditions
- able to give basic first aid.

Suggested Activities/Community Partnerships

1. a. Which local agencies offer first aid courses in the community or within the school district?

   b. Participate in a first aid training course.

2. Discuss with the teacher/supervisor the procedures when an accident or injury occurs. Use Resource 13, "Emergency Procedures Chart" to record the proper procedures to follow in school or in the workplace.

3. Resource 11, "The Accident Sequence" may be used as an information sheet to reinforce the fact that most accidents are caused by human error.

4. As an introduction to the proper handling of hazardous materials, the following video may be used:

   WHMIS Working for You, Alberta Occupational Health and Safety, 1989.

CAREER OPPORTUNITIES
INTERVIEW GUIDE

COURSE: ______________________ **Student's Name:** ______________________

Name of person interviewed: __________ Date: _____ Occupation: ______________________

1. What are the entry-level requirements in this occupation?

2. What general technical knowledge is required?

3. What general practical skills are required?

4. Can this job be performed by a handicapped person? (Please specify type of handicaps that may interfere with this job.)

5. a. How long have you been working in this career field?

   b. How long have you been the owner/operator/manager of this business/industry?

6. What additional knowledge and skills did you need to become an owner/operator/manager?

7. What were the steps in your climb up this career ladder?

8. Would you recommend this career to me? Why? Why not?

9. If I decide to enter this career, are there any other special entry-level requirements of which I should be aware? Please specify what they are.

____

____

10. a. Is joining a union mandatory? ☐ Yes ☐ No

b. If yes to 10a, what are the advantages/disadvantages of becoming a member of a union?

Advantages	Disadvantages

c. Which union is involved with this job? ______________________

d.
- How much are the union fees? ______________________
- How frequently are they paid? ______________________

11. a. How much money could an entry-level employee in this occupation expect to earn? (Hourly? Weekly? Monthly? Annually?)

____

b. Are there opportunities to increase my income? ____ How? (E.g., overtime, further education, length of service, previous experience.)

____

12. a. Describe the working conditions in this occupation? ______________________

____

b. What do you like most about your working conditions?

____

c. What do you like least about your working conditions?

____

PERSONAL INTERESTS AND ABILITIES INVENTORY

This inventory is meant to help you identify the things you like to do and the things you do well.

1. THINGS I LIKE TO DO:

You know what you like to do and what you don't like to do. Most people like to do things they do well. Read through this list and make a check under 'Yes' if it is something you like doing. If it is something you don't like doing make your check under 'No'. If it's something you like doing now and then, make your check under 'Sometimes'.

EXAMPLE:	Yes	Sometimes	No
I like washing dishes	☐	☑	☐
I like fixing cars	☑	☐	☐
I like drawing	☐	☐	☑

	Yes	Sometimes	No
I like helping people	☐	☐	☐
I like serving people	☐	☐	☐
I like fixing things	☐	☐	☐
I like selling things	☐	☐	☐
I like working with machines	☐	☐	☐
I like teaching children	☐	☐	☐
I like adding numbers	☐	☐	☐
I like typing	☐	☐	☐
I like swimming	☐	☐	☐
I like cleaning homes	☐	☐	☐
I like applying make-up	☐	☐	☐
I like cooking food	☐	☐	☐
I like driving	☐	☐	☐
I like exercising	☐	☐	☐
I like sewing	☐	☐	☐
I like working with tools	☐	☐	☐
I like working with animals	☐	☐	☐
I like handling money	☐	☐	☐

	Yes	**Sometimes**	**No**
I like styling hair	☐	☐	☐
I like growing plants	☐	☐	☐
I like listening to music	☐	☐	☐
I like playing a musical instrument	☐	☐	☐
I like baking	☐	☐	☐
I like arranging flowers	☐	☐	☐
I like delivering parcels and letters	☐	☐	☐
I like playing sports	☐	☐	☐
I like travelling	☐	☐	☐
I like gardening	☐	☐	☐
I like painting houses	☐	☐	☐
I like singing	☐	☐	☐
I like dancing	☐	☐	☐
I like taking photographs	☐	☐	☐
I like washing windows	☐	☐	☐
I like walking	☐	☐	☐
I like talking on the telephone	☐	☐	☐
I like teaching adults	☐	☐	☐
I like coaching sports	☐	☐	☐
I like doing crafts	☐	☐	☐
I like cleaning carpets	☐	☐	☐
I like moving furniture	☐	☐	☐
I like making people laugh	☐	☐	☐

Other things I like to do:

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JOB SURVEY CHART

Student's Name: ______________________

Occupation: ______________________

Major tasks performed: ______________________

____

1. WAGES

Highest, lowest and average wage offered to entry-level employee in this community

- Highest entry-level wage ______________ (indicate if wages are
- Lowest entry-level wage ______________ hourly, weekly, monthly
- Average entry-level wage ______________ or annual rates)

2. WORKING CONDITIONS

List the working conditions in the occupation as being either positive or negative

Positive Working Conditions	Negative Working Conditions
______________	______________
______________	______________

3. JOB REQUIREMENT

______________	______________
______________	______________

4. OCCUPATIONAL CHOICE

(Select (a) or (b) and complete the sentence.) This occupation:

a. interests me as a possible career choice because:

____

____

____

b. does not interest me as a possible career choice because:

____

____

____

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WHAT DO YOU DO WELL?

Now you have an idea of what things you like to do. Of course, there are some things that you like to do more than others. You probably can do some things better than other things. Maybe you can fix a car, but you can't decorate a birthday cake. Maybe you can talk with all kinds of people, but you can't drive a car or truck.

1 Knowing what you **like** to do is the first step in planning your career.

2 Knowing what you **can do well** is your next step.

Read this list of skills. If you can do the skill well, make your check under the words 'Can Do Well'. If you can do it, but you're not that good at doing so, make your check under 'Can Do'. If you can't do it at all, make your check under 'Can't Do'.

Don't sell yourself short. There will be many things you can do well.

ABILITY INVENTORY

EXAMPLE:	**Can Do Well**	**Can Do**	**Can't Do**
I can speak two languages	☑	☐	☐
I can train dogs	☐	☐	☑
I can sew dresses	☐	☑	☐

	Can Do Well	**Can Do**	**Can't Do**
I can lift heavy objects	☐	☐	☐
I can drive a truck	☐	☐	☐
I can sell things	☐	☐	☐
I can convince people	☐	☐	☐
I can organize people	☐	☐	☐
I can plan a party	☐	☐	☐
I can cut hair	☐	☐	☐
I can build houses	☐	☐	☐
I can tidy tables	☐	☐	☐
I can cook	☐	☐	☐
I can bake	☐	☐	☐
I can build a brick wall	☐	☐	☐
I can build furniture	☐	☐	☐
I can style hair	☐	☐	☐
I can fix car engines	☐	☐	☐
I can fix small appliances	☐	☐	☐
I can fix plumbing	☐	☐	☐
I can care for small children	☐	☐	☐
I can type	☐	☐	☐
I can help people who are upset	☐	☐	☐

	Can Do Well	**Can Do**	**Can't Do**
I can file letters	☐	☐	☐
I can teach children	☐	☐	☐
I can use a computer	☐	☐	☐
I can speak to a group of people	☐	☐	☐
I can paint a picture	☐	☐	☐
I can play a sport	☐	☐	☐
I can write a story	☐	☐	☐
I can tell a story	☐	☐	☐
I can rearrange a room to look better	☐	☐	☐
I can learn new things	☐	☐	☐
I can pay bills	☐	☐	☐
I can buy groceries	☐	☐	☐
I can entertain people	☐	☐	☐
I can add numbers	☐	☐	☐
I can do tax forms	☐	☐	☐
I can make a budget	☐	☐	☐

Are there other things you can do that aren't listed here? List them here:

____

____

____

____

____

____

____

____

____

____

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PERSONAL HYGIENE PRACTICES

OCCUPATIONAL COURSE: ____________ STUDENT'S NAME: ________________

INDUSTRY/BUSINESS VISITED	PUBLIC HYGIENE PRACTICES OBSERVED
1. Name: Address:	
2. Name: Address:	
3. Name: Address:	

Students must obtain permission from the following persons before visiting a workplace to collect this information:

- teacher or supervisor
- industry or business owner/manager.

PROVINCE OF ALBERTA

INFORMATION ON OCCUPATIONAL HEALTH AND SAFETY REGULATIONS

OCCUPATIONAL HEALTH AND SAFETY LEGISLATION

Safety Regulations:
For more information concerning safety regulations, please contact the nearest regional office of the Inspection Branch, Occupational Health and Safety Division.

9321 - 48 Street
EDMONTON, Alberta
T6B 2R4

Phone: 427-8848

2nd Floor
1021 - 10 Avenue S.W.
CALGARY, Alberta
T2R 0B7

Phone: 297-2222

3rd Floor, Provincial Building
10320 - 99 Street
GRANDE PRAIRIE, Alberta
T8V 6J4

Phone: 529-3530

6th Floor, Provincial Building
9915 Franklin Avenue
FORT McMURRAY, Alberta
T9H 4C7

Phone: 329-5522

6th Floor, Provincial Building
4920 - 51 Street
RED DEER, Alberta
T4N 5Y5

Phone: 343-5170

Hygiene Regulations:
For more information concerning hygiene regulations please contact the nearest regional office of the Medical Services Branch, Occupational Health and Safety Division.

2nd Floor
1021 - 10 Avenue S.W.
CALGARY, Alberta
T2R 0B7

Phone: 297-2432

9321 - 48 Street
EDMONTON, Alberta
T6B 2R4

Phone: 427-8848

For information on Occupational Health and Safety education programs and information services, please contact the nearest regional office of the Education and Program Development Branch, Occupational Health and Safety Division.

1st Floor
1021 - 10 Avenue S.W.
CALGARY, Alberta
T2R 0B7

Phone: 297-7282

9321 - 48 Street
EDMONTON, Alberta
T6B 2R4

Phone: 427-4788

INDUSTRIAL STANDARDS REFERENCED OR ADOPTED BY REGULATIONS

NOTE: The industrial health and safety standards referenced or adopted by Occupational Health and Safety Regulations may be purchased from the following sources:

AMERICAN STANDARDS INSTITUTE (ANSI)
c/o Standards Council of Canada
Standard Sales Service
2000 Argential Road, Suite 2-401
Mississauga, Ontario L5N 1V8

Phone: (416) 826-8110

(Prepayment is not required, but billing will be in Canadian funds.)

CANADIAN STANDARDS ASSOCIATION (CSA)
5524 - 99 Street
Edmonton, Alberta
T6E 3N7

Phone: (403) 436-8553
Telex: 037-2605

(Prepayment is required. MasterCard, Visa, American Express, cheques and cash are accepted.)

178 Rexdale Boulevard
Rexdale, (Toronto), Ontario
M9W 1R3

Phone: (416) 744-4000
Telex: 06-989344

(Orders of more than $125.00 may be invoiced. Prepayment is required on lesser amounts.)

SOCIETY OF AUTOMOTIVE ENGINEERS (SAE)
400 Commonwealth Drive
Warrendale, Pennsylvania
USA 15096

Phone: (412) 776-4841

(Standards must be ordered from the U.S.A., unless standards have been adopted by ANSI. If a standard has been adopted, it may be purchased from ANSI's Canadian distributor, the Standards Safety Council.)

UNDERWRITERS LABORATORIES (UL)
7 Crouse Road
Scarborough, Ontario
M1R 3A9

Phone: (416) 757-3611

(Prepayment is required on orders of fewer than $50.00.)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)
Batterymarch Park, Quincy
MA 02269 USA

Phone: (617) 328-9290

(Must be ordered from the U.S.A. Invoicing procedures are acceptable.)

NOTE: Reference copies of the Industrial Health and Safety Standards referenced or adopted by regulations are also available at the regional field office of the Inspection Branch (listed on page 48) and at the two regional Occupational Health and Safety Libraries, listed below:

5th Floor, Donsdale Place
10709 Jasper Avenue
EDMONTON, Alberta
T5J 3N3

1st Floor
1021 - 10 Avenue S.W.
CALGARY, Alberta
T5R 0B7

THE LAW GOVERNING OCCUPATIONAL HEALTH AND SAFETY IN ALBERTA (As in effect September, 1990)

THE OCCUPATIONAL HEALTH AND SAFETY ACT is also known as a statute. It is the basic, legal authority for occupational health and safety law in Alberta. The Act is adopted or amended, in a public forum, by the Legislative Assembly. The Act sets out the general rights and responsibilities, basic requirements and fundamental principles of occupational health and safety law in the province.

THE OCCUPATIONAL HEALTH AND SAFETY REGULATIONS are created under the authority of the ACT, but cannot exceed this authority. After being reviewed by the public, the regulations are adopted or amended, in a private setting, by the Cabinet. The regulations set out the details of occupational health and safety law, including performance objectives and specific procedural rules.

INDUSTRY SAFETY CODES OR STANDARDS consist of information prepared and distributed by non-government agencies — such as the Canadian Standards Association. Industry safety codes and standards may be used to form the opinion of an occupational health and safety officer, or they may be accepted as evidence in a court of law. Safety codes and standards may also be adopted by regulation, in which case they become part of the Occupational Health and Safety Regulations.

CODES OF PRACTICE contain information prepared by an employer for the work site. The creation of a Code of Practice is usually required by regulation. A Code of Practice contains useful information, including detailed instructions for the use and safe operation of equipment, and the use or application of hazardous materials or designated substances. They may be used to form the opinion of an occupational health and safety officer, or they may be accepted as evidence in a court of law.

OTHER ITEMS GOVERNING OCCUPATIONAL HEALTH AND SAFETY IN ALBERTA

GUIDELINES are information prepared and distributed by government. They may include data sheets, recommended practices and other non-regulatory information. Guidelines may be used to form the opinion of an occupational health and safety officer, or they may be accepted as evidence in a court of law.

SAFE OPERATING PROCEDURES consist of information prepared and distributed by employers, in co-operation with workers — usually through their respective safety associations or unions. Safe Operating Procedures include recommended practices and other non-regulatory information. They may be used to form the opinion of an occupational health and safety officer, or they may be accepted as evidence in a court of law.

From: An Employers Guide: The Occupational Health and Safety Act, p.9. Reprinted with the permission of Alberta Occupational Health and Safety.

ALBERTA'S EMPLOYMENT STANDARDS CODE

RIGHTS AND OBLIGATIONS OF EMPLOYEES AND EMPLOYERS

The Employment Standards Code sets out the minimum provisions that apply to Alberta employees and employers under provincial jurisdiction. The Employment Standards Code is administered by the Employment Standards Branch of Alberta Labour.

EDUCATION AND COMMUNICATION

Successful employment relationships require open and honest communication between employees and their employers. Both parties have rights and obligations. Positive relationships are best achieved when employees and employers understand their rights and live up to their obligations. Employers have the right to establish conditions of employment and have an obligation to ensure conditions of employment are not less than the minimum legal standards. Employees have an obligation to provide a level of service consistent with the established conditions of employment. Awareness, mutual respect and open communication help build good employee-employer relations.

GROUP TERMINATIONS

Employers are required to provide the Minister of Labour with four weeks notice of their intention to terminate the employment of 50 or more employees in a single location within a four-week period. This provides time for employers and employees to be made aware of existing government employment adjustment and retraining programs.

WAGE RATE CHANGES

If an employer wishes to reduce an employee's wage rate, overtime rate or entitlements, the employee must be informed before the pay period in which the change is to take place.

EMPLOYMENT RECORDS

An employer must record the hours of work of employees daily. Additional records that must be maintained include: details of wages and overtime, wage and overtime rates, vacation and general holiday payments and deductions from employee earnings. Employees must receive a detailed written statement of earnings and deductions for their retention each pay period.

MINIMUM WAGES

Effective September 1, 1988 Alberta's minimum wage rates are:

- $4.00/hour for students under 18 years of age, employed outside normal daily school hours, or on a weekend, a vacation period or any other day the school is officially closed
- $4.50/hour for all other employees.

Certain salespersons receive a minimum of $180.00 per week.

Employees must receive a minimum payment when they report for work and no work is provided. The minimum wage may be reduced by specific amounts for meals and lodging.

HOURS OF WORK AND OVERTIME

Hours of work must be confined within a period of twelve consecutive hours in any one day.

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Overtime Pay
If an employee works forty-four hours or fewer in a one-week period, but works more than eight hours on any day, overtime pay shall be paid for each hour in excess of eight hours per day.

If an employee works more than forty-four hours in a one-week period, the hours of work in excess of eight hours in each day shall be totalled and the hours of work in excess of forty-four hours in the week shall be calculated. The overtime rate shall be paid for whichever is greater.

Employees must receive not less than one and a half times their regular wage rate for overtime pay.

Overtime Agreement
Employees and employers may enter into a written overtime agreement providing it is not a condition of employment and is accepted by either the individual or a majority of employees affected. With an agreement instead of overtime pay, employees will receive time off with regular pay equal to the number of overtime hours worked.

Compressed Work Week
A compressed work week schedule provides increased daily hours of work in consideration of increased rest days. Alberta Labour's Director of Employment Standards must be notified before the schedule is implemented.

HOURS OF REST

An employer must provide at least one day of rest in each week. Rest days may be accumulated for up to four weeks and given as consecutive days off.

Employees must receive a half-hour rest period, paid or unpaid, during each shift in excess of five consecutive hours of work. Some exceptions apply. Refer to Part 2, Division 5 of the Employment Standards Code.

VACATIONS

Employees are entitled to a minimum of two weeks' vacation with pay after one year of employment and three weeks' vacation with pay after five years of employment with an employer.

At the written request of an employee, the employer may grant the employees annual vacation in periods of not less than one day. The employer has final approval of the time when the annual vacation is to be taken.

GENERAL HOLIDAYS AND GENERAL HOLIDAY PAY

In Alberta, the following are general holidays: New Year's Day; Good Friday; Victoria Day; Canada Day; Labour Day; Thanksgiving Day; Remembrance Day; Christmas Day; and any other day designated by the employer.

Employees who have worked for an employer thirty days in the twelve-month period before the holiday are entitled to general holidays and general holiday pay.

When the holiday falls on a regular work day and the employee is not required to work, the employee will receive a regular day's pay. If employees are required to work in the holiday they must receive one and a half times the regular rate of pay for all hours worked.

If a general holiday falls during an employee's annual vacation, the employer must extend the employee's vacation by one day with pay. Alternatively, by agreement, the employer must provide an additional day off with pay before the employee's next annual vacation.

PARENTAL BENEFITS

Maternity Leave

Women employed with the same employer for twelve months are entitled to eighteen weeks of unpaid maternity leave. Leave may begin at any time during the twelve weeks before the estimated date of birth. The employee must give her employer two weeks written notice of the date she intends to begin leave and the date she intends to resume employment or resign.

Adoption Leave

A male or female employee employed twelve months with the same employer is entitled to eight weeks of unpaid leave when adopting a child under three years of age. An employee must give the employer written notice of leave at least two weeks before the expected custody of the child. If two weeks notice cannot be given, the employer must be notified immediately after notice of the adoption is received. The employee must provide two weeks written notice before returning to work or resigning.

Employees returning from maternity or adoption leave must be reinstated in the same or a comparable position with the same wages, entitlements and other benefits that pertained when the leave began.

EMPLOYMENT OF ADOLESCENTS AND YOUNG PERSONS

Persons 12 to 15 years of age may:
- make deliveries for a retail store
- deliver newspapers or flyers, or
- be a clerk in an office or retail store

if such employment is not injurious to the adolescent's life, health, education or welfare. Other similar types of work may be approved by the Alberta Labour's Director of Employment Standards. The parent or guardian of any adolescent so employed must agree to the employment and provide written consent to the employer.

Employees 12 to 15 years of age can work only two hours on a school day and a maximum of eight hours on a non-school day. They cannot work between the hours of 9:00 p.m. and 6:00 a.m.

Employees 15 years or older, but under 18 years, cannot be employed between the hours of midnight and 6:00 a.m. at, or in connection with:
- any retail store selling food or beverages or any other merchandise
- a retail business selling gasoline or other petroleum products
- a motel, hotel, inn, etc.

Employment is permitted in such premises between 9:00 p.m. and midnight if the employee works with and is in the continuous presence of at least one other individual 18 years old or older.

TERMINATION OF EMPLOYMENT

Employees wishing to terminate their employment must give the employer a written notice of their intent to terminate, of at least:
- one week, if employed more than three months but less than two years
- two weeks, if employed two years but less than four years
- four weeks, if employed for four years but less than six years

- five weeks, if employed six years but less than eight years
- six weeks, if employed eight years but less than ten years
- eight weeks, if employed over ten years
- the wages the employee would have earned for the applicable period of notice
- a combination of written notice of termination and the wages the employee would have earned for the applicable period of notice.

No notice of termination is required if the employee is employed for three months or less. Other exemptions apply. Refer to Part 2, Division 9 of the Employment Standards Code.

Note: This information is designed to highlight the key provisions of the Employment Standards Code and assist you in understanding your rights and obligations in the workplace. If you have further questions or require specific information, please refer directly to the Employment Standards Code or contact the Employment Standards Branch in your area.

PUBLIC HYGIENE PRACTICES

OCCUPATIONAL COURSE: ____________ STUDENT'S NAME: ____________

INDUSTRY/BUSINESS VISITED	PUBLIC HYGIENE PRACTICES OBSERVED
1. Name: Address:	
2. Name: Address:	
3. Name: Address:	

Students must obtain permission from the following persons before visiting a workplace to collect this information:

- teacher or supervisor
- industry or business owner/manager.

SAFETY PROCEDURES AND REGULATIONS

Your occupational lab simulates industry. In any industry, there are hazards to safety that make regulation and strict standards of behaviour necessary. If you decide not to follow these regulations, there is a good chance you will injure yourself. You may also cause your friend or fellow student injury and you may damage expensive equipment. In industry, if a worker is found to be a hazard to his fellow workers or to equipment, he is fired or moved to a job where he can't do any damage. Because we are working in a place very much the same as any industrial plant, we also have to have some regulations to guide us. These regulations will be enforced so that you will be able to work without injury to yourself or others.

THE FOLLOWING REGULATIONS WILL BE ENFORCED IN THE LAB

1. Leave coats, sweaters and other personal belongings in your locker. No coats will be allowed in the lab.
2. Candy and gum are safety hazards and cannot be permitted in the lab at any time. When you enter the lab, place your gum or candy in the trash can and go DIRECTLY to your station.
3. Talking is not allowed during roll call or when a lesson is being presented. Shouting, whistling or other distracting noises are not permitted. If you have a question or wish to speak, please raise your hand and wait to be recognized.
4. No HORSEPLAY OR ROWDINESS will be tolerated in the lab at any time.
5. No power equipment is to be operated without proper instruction and the permission of the instructor.
6. Safety equipment shall be used at all times, and safety suggestions must be followed.
7. All accidents and breakages must be reported to the teacher immediately.
8. Clean-up is everyone's responsibility. "A CLEAN LAB IS A SAFE LAB." If you make a mess, you are responsible for cleaning it up. When your clean-up duties are done at the end of the period, return to your seat.
9. Please keep your hands off other students and their property.
10. Running in the lab is not permitted.

The above regulations are essential for your own safety as well as that of your friends. Only by observing them can you gain maximum benefit from your time in the lab. However, if you do violate a regulation the following will result:

A. First Violation – warning from the instructor.
B. Second Violation – disciplinary action.
C. Third Violation – removal from the lab for a period of about one week.

Each time a violation occurs, you must fill out and sign a violation sheet as a record of what happened and what action was taken.

SAFETY SUGGESTIONS FOR CLOTHING AND DRESS IN THE LAB

1. Sweaters, coats and jackets must be left in your locker.
2. Sleeves should be rolled tightly above the elbow.
3. Jewelry (rings, watches, bracelets, neck charms) should be removed and left in your locker. Floppy belts tucked in.
4. Hair, if excessively long (shoulder length or longer), must be held back with a pin, hair net or elastic band.
5. Aprons, if worn, should be tied snugly at the back. All shirts or blouses should be tucked in.
6. Shoelaces must be tied tightly. High-heeled shoes or boots are not permitted. Thick leather shoes are preferable.
7. Eye glasses should be held in place with a band around the head. (The same type of band as is worn for sporting activities.)

REMEMBER! 88 percent of all accidents can be prevented by avoiding **unsafe acts**.

THINK BEFORE YOU ACT! DON'T BECOME A STATISTIC!

SAFETY SUGGESTIONS FOR MATERIALS IN THE LAB

1. Place all flammable liquids, acids and solvents in appropriate containers and keep them in metal cabinets.
2. Large quantities of flammable material should be stored in an area separate from the lab proper.
3. Properly label and mark all containers containing flammable materials and acids. Mark all drawers, boxes, bins and cabinets containing such materials with the correct identity.
4. Wear protective clothing, such as a face shield, rubber gloves and an apron when mixing toxic or volatile chemicals or liquids.
5. Deposit all scraps, shavings, chips and oily waste material in proper containers. Oily rags should be deposited in a metal can.
6. When mixing acid and water, remember, ADD ACID TO WATER; never water to acid.
7. Supplies and materials should never be stored on top of lockers or cabinets.
8. Material, when stored, should not be out of reach.
9. Hands should be thoroughly washed after working with toxic chemicals such as film developers. Always be sure to wash your hands before leaving the lab.

SAFETY SUGGESTIONS FOR HAND TOOLS

1. Hand tools should be maintained continually and kept in sharp cutting condition.
2. Use the proper type and size of hand tools. Keep in mind the job being done and the stock being used.
3. When working with a sharp-edged tool, be sure that the sharp edge of the tool is pointing down and held away from the body.
4. When passing sharp-edged tools from one student to another, pass the handle first. Never throw a tool around.
5. When working with a sharp-edged tool on small stock, the stock should be firmly clamped in a vise and hands kept behind the cutting edge of the tool.
6. When using a chisel or other sharp-edged tool always pare or cut away from the body rather than toward it.
7. Wear safety glasses or shields when performing any operation that will result in chips, shavings or possible flying particles.
8. Never permit sharp-edged tools to project beyond the edge of the workbench.
9. Never carry sharp-edged tools in your hip pocket.
10. Keep your eyes constantly on the material being used.
11. If using portable electric hand tools, make sure that such tools are properly grounded.

SAFETY SUGGESTIONS FOR MACHINES

1. No machine should be operated without first receiving permission from the instructor.
2. The instructor should inspect both the stock and the machine to ensure that you have selected the proper machine for the job and that it is properly adjusted.
3. No machine is to be operated while the instructor is away from the lab.
4. Students are not to use any machine unless specific instruction has been given on the use of such a machine.
5. No electrical machine shall be adjusted, oiled or cleaned until it has come to a complete stop.
6. All safety guards and enclosures are to be in their proper positions when using a power-driven machine.
7. The power should be turned off when the job is complete. Never walk away from a machine and leave it running.
8. Before starting any job, make sure that the work table or surface of the machine is completely free of scraps, tools or stock.

9. All scraps of wood and refuse should be cleared from the floor around the machine.
10. Keep fingers away from all moving parts of the machine.
11. Students should not distract other students who are using a machine nor should the student using the machine engage in conversation with anyone while the machine is running.
12. Never begin to use a machine until it has reached top speed.
13. Never attempt to hasten the stopping of a machine by jamming stock into its moving parts or by grabbing the rotating spindle or belts.
14. When making special cuts and set-ups on a machine that may involve hazards, ask the teacher to examine and approve the set-up before starting work.
15. Check all stock to see that it is free from grit, nails and loose knots.
16. Safety goggles or safety shields should be worn at all times when operating any machine tools.
17. Be sure that everyone is clear of the machine before turning on the power switch.
18. Stay clear of a machine being operated by another student. The only student inside the safety zone should be the student operator of the machine.
19. Be agreeable with other students. Respect each other's rights and privileges. While in the lab, cooperate wherever and whenever possible.

THE ACCIDENT SEQUENCE

If it is true that accidents don't just happen, but are caused, how can the supervisor recognize the symptoms in time to counteract them effectively? People are generally the cause in a majority of the accidents and there are certain identifiable key factors of behaviour. When two or more of these factors come together, an accident occurs, which may or may not result in injury or property damage. Such a combination of factors is called an "accident sequence". The accident sequence can be demonstrated by the use of dominoes. Remember how you would set up a row of dominoes, push the end one and they all would fall, each one knocking over its neighbour? Well, here is the "accident sequence" set of dominoes.

HEREDITY is the set of characteristics with which people are born.

BEHAVIOUR is a set of characteristics that are developed or acquired as a result of life's experience.

UNSAFE CONDITION is any physical hazard or defect.

ACCIDENT is an unintended event that interrupts a normal procedure or practice.

INJURY is physical damage to a person or persons, and may be a serious result of any accident.

STOPPING THE ACCIDENT SEQUENCE

Proper selection of personnel plays a major role in the accident prevention sequence. Effective selection and testing techniques can help to single out the prospective employee who may require special training in safe procedures.

Proper attitude is a vital component of good on-the-job performance. Good habits in the workplace must replace indifference; an enthusiastic employee will display and develop a positive attitude in carrying out work assignments.

Reporting unsafe conditions is the responsibility of both the supervisor and the employee. Employees must be trained to do so.

Use of personal protective equipment is the means of preventing an injury or at least lessening the severity of it.

First aid training is invaluable to handle any on-the-job injury.

SUMMARY

An accident is an unintended event that interrupts a normal work procedure or practice and results in work stoppage, in damage to equipment or property, or in injury. Accident statistics indicate that for every single disabling injury there are 29 non-disabling injuries, and for every 30 injury cases there are 300 non-injury cases. To combat accidents, teachers and supervisors must recognize and accept that they have the primary responsibility of ensuring the safety of all the employees working under them. They must also realize that each and every accident to employees may stem from their failure to take the steps necessary to prevent them. Since the majority of accidents take place on the job, teachers and supervisors can greatly reduce the chances of accident by being aware of the factors involved in the accident sequence – heredity, behaviour, unsafe condition/act, accident, and injury, and by taking the necessary preventative measures, such as proper employee selection, developing proper attitude, reporting and eliminating unsafe conditions/acts and, in the case of an injury, rendering first aid immediately.

BEAT THESE ODDS!

For Every	330	Accidents
There Are	29	Minor Injuries
And	1	Major Injury or Death

Thus, there are 300 accidents not resulting in injury. The odds are 300 to 30 or 10 to 1 that you will *not* **be hurt in an accident. If you think these are good odds perhaps you had better think again!**

CONCLUSION

You can eliminate 98 percent of all accidents that happen in the lab by:

1. **Avoiding Unsafe Acts**
2. **Avoiding Unsafe Conditions**

It is not enough that you know the safety rules, you must practise them constantly and be on your guard to eliminate the above two causes of all accidents.

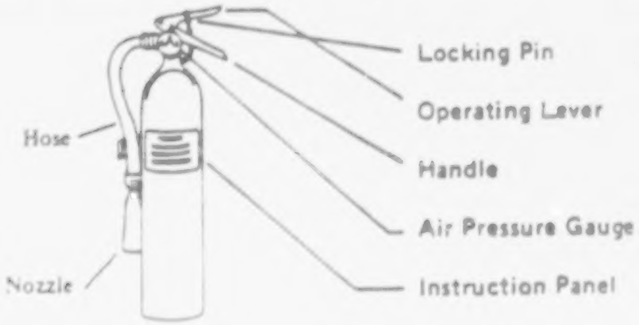
KINDS OF FIRE EXTINGUISHERS

A fire extinguisher is a metal container filled with water and/or chemicals for use in fighting fires.

There are three kinds of extinguishers for home use. A Class A extinguisher is used **only** on fires caused by wood, cloth, and other ordinary burnable materials. A Class B extinguisher is used **only** on fires started by burnable liquids. A Class C extinguisher is **only** for fires involving electrical equipment. It is best to have at least one of each kind of fire extinguisher in your home. Some extinguishers are good for more than one kind of fire.

To operate a fire extinguisher, hold it upright, and pull the locking pin. Aim the nozzle at the base of the fire. Squeeze the handle and use a side-to-side motion over the flame.

Below is a picture of a fire extinguisher with its parts labelled.



Answer the questions below with A, B, or C, depending on the kind of extinguisher you would need to put out the particular fire.

1. cooking grease __________
2. short circuit in a motor __________
3. light switches __________
4. gasoline __________
5. rubbish fire __________
6. vegetable oil __________
7. electrical wiring __________
8. fire in a wastebasket __________
9. paper __________
10. oils __________

EMERGENCY PROCEDURES CHART

After you have received instruction in and had a demonstration of proper procedures to follow in emergency situations, use this procedures chart to record the procedures used in case of different emergencies (e.g., accidents, injuries).

EMERGENCY	PROCEDURE

2. ORGANIZATIONAL SKILLS

All occupations are composed of a number of different tasks which a worker is expected to perform. Every task requires some planning and organization if it is to be completed on time and to the satisfaction of self and others.

The ability to plan and organize work and to practise ethical behaviour in the workplace are important skills in all occupations.

The organizational skills included in this unit are:

A. Work Ethics

B. Planning and Organization

C. Time Management

D. Task Management

E. Work Standards

RESOURCES

STUDENT RESOURCE

Working: Today and Tomorrow, Canadian Edition. Toronto, Ontario: Irwin Publishing, 1990.

Correlation of Learning Objectives with Student Resource

Concepts, Skills and Attitudes	*Working: Today and Tomorrow*
2. Organizational Skills	
A. Work Ethics	Chapters 8, 10 "The Importance of Attitude"
B. Planning and Organization	Chapter 12 "The Benefits of Planning"
C. Time Management	Chapter 12 "Your Time"
D. Task Management	Chapter 9 "Getting Ahead in Your Job"
E. Work Standards	Chapter 11

TEACHER RESOURCES

- Resource 14, "Ethical Characteristics of Behaviour – Evaluation Chart"
- Resource 15, "Sample Organization Chart"
- Resource 16, "Sample Time Sheet"
- Statement of ethics from related occupations/organizations
- Student Workbooks
- Community partners

A. WORK ETHICS

Each person lives by a set of personal ethics that help shape individual behaviour at home, in the school and in the workplace.

In the world of business and industry, ethics often include:

- statements concerning desirable and expected worker conduct
- the way in which each worker acts toward work and relates to others in the workplace.

An understanding of the concept of ethics and the practice of ethical behaviour in the workplace are essential entry-level occupational skills.

The concepts, skills and attitudes related to work ethics developed in this unit include:

1. Defines "ethical behaviour".

2. Recognizes the relationship between ethics and human behaviour.

3. Demonstrates willingness to participate.

4. Demonstrates punctuality and reliability.

1. ETHICS DEFINED

The Gage Dictionary defines ethics as:

> "the discipline dealing with what is good and bad, and with moral duty and obligation"
>
> and
>
> "the principles of conduct governing an individual or a group"

Each person, profession and occupation, usually have their own set of ethics. Ethics may be formal; that is, they are written for all to see. Or they may be implied; that is, they are unwritten but generally understood, accepted and practised.

Statements of ethics commonly include:

- Statements of rights
- Statements of responsibilities
- Statements of acceptable relations with others
- Statements of acceptable dealings with others.

Suggested Activities/Community Partnerships

1. Brainstorm:

   a. What are your personal ethics?

   b. What are the ethics of ___________ (occupational area)?
   (You may wish to read some of the statements of ethics included in the A.T.A. diary.)

2. Invite community members to talk about the ethics of their trade, industry, or business.

3. Obtain written statements of ethics, where possible, from local representatives of business, industry, trade or craft associations (e.g., local labour unions, professional bodies).

2. ETHICS AND HUMAN RELATIONS

There is a need for students to recognize that ethics are not just statements about behaviour. Statements of ethics guide our relationships with others.

The practice of ethical behaviour will usually determine how successful people are in building and maintaining good relationships with others. In the school and in the workplace, the practice of ethical behaviour is essential to:

- getting a job
- retaining a job
- maintaining relationships
- success in business and industry.

Suggested Activities/Community Partnerships

1. Discuss:

   a. Why are ethics important in guiding relationships with others?

   b. Which of the following human traits are related to a person's ethical behaviour? How is each trait related to your behaviour?
      - Dependability
      - Enthusiasm
      - Honesty
      - Cooperation
      - Courtesy
      - Self-control
      - Hard work
      - Initiative
      - Loyalty
      - Adaptability
      - Patience
      - Tact

2. a. When participating in an extended field experience activity (e.g., one week or longer in one workplace), suggest to your teacher/supervisor that you would like him or her to evaluate your ethical behaviour as well as other aspects of your performance on the job. Provide your teacher/supervisor with a copy of Resource 14, "Ethical Characteristics of Behaviour - Evaluation Chart".

   b. On a monthly basis, use the chart to evaluate your own ethical behaviour.

3. a. Role play examples of positive and negative ethical behaviour that may occur in related occupations.

   b. Discuss:
      - How can ethical behaviour in the workplace be encouraged?
      - How should unethical behaviour in the workplace be handled?

3. PARTICIPATION

For various reasons, individual students may refuse to participate in a specific class or field experience activity. Experience indicates that encouragement rather than punishment tends to get more positive results.

Similarly, publicly labelling or identifying a student as a non-participant may reinforce the student's negative behaviour.

Suggested Activities/Community Partnerships

1. a. Brainstorm:
    - What is the meaning of "teamwork"?
    - Why is teamwork important in the home, the school, the community and in the workplace?

    b. Give examples of where teamwork is important:
    - in the home
    - in the school
    - in the community
    - in the workplace.

2. Invite a local volunteer organizer to discuss the importance of community participation and volunteerism in the community.

3. Discuss:
    - What important roles do volunteers play in the community?
    - What would happen if there were no volunteers?
    - What benefits can a person gain from participating in a volunteer activity?

4. PUNCTUALITY AND RELIABILITY

Tardiness and irregular attendance may be chronic problems. Community partnerships, especially field experiences, help students to appreciate the consequences of poor attendance and tardiness.

Some tried and tested tips:

- establish attendance and punctuality expectations early in the course
- specify possible consequences of poor attendance and tardiness
- provide statement of expectations and the consequences of failure to each student
- be consistent in applying consequences
- be understanding and flexible when establishing expectations and consequences.

Note: Buddy "wake-up" and "pick-up" arrangements have worked well in some schools.

Suggested Activities/Community Partnerships

1. a. Visit occupation related workplaces and identify the different methods used to record the attendance and punctuality of employees.

    b. List and describe the advantages/disadvantages of each method.

2. a. If you operated your own business, what would you do to encourage staff to come to work regularly and on time?

   b. What strategies would you recommend that your teacher/supervisor use to encourage good attendance by every student in your class?

B. PLANNING AND ORGANIZATION

Planning and organizational skills relate to the ability to group and arrange people and/or materials so that, together, they contribute to the efficient and effective operation of a business or an industry.

Students who develop effective planning and organizing skills are better able to function in the home, the school, in the community and in the workplace.

The concepts, skills and attitudes related to planning and organization developed in this unit include:

1. Defines "planning" and "organizing".
2. Identifies components and component sequence of a task.

1. PLANNING AND ORGANIZING DEFINED

Planning is a process that involves:

- identifying the job to be done
- identifying the components of the job
- putting the job components in usable order
- seeing that the job is completed in a given time.

Organizing is the ability to group and arrange people and/or materials so that, working together, they contribute to the efficient running of a home, a school, a business, industry or any other organization.

A successful business invariably has efficient organization.

Suggested Activities/Community Partnerships

1. Describe two activities in the planning of which you were involved (e.g., a family holiday, a school field trip, a community group activity).
   a. List the steps involved in each plan.
   b. Draw a flow chart to show the order in which each step was performed. (See Suggested Teaching Strategies, "Flow Charting: A Process Analysis Strategy".)
2. What parts of your student workbook may be described as plans? Explain your answers.

3. a. The courses that you are now taking are part of your program plan. What courses might you take in:
      - Grade 11?
      - Grade 12?

   b. How may the high school courses you take fit in with your career plan?

4. a. Discuss: "How is the school organized?"

   b. Draw an organization chart to show the school's organization? (See Resource 15, "Sample Organization Chart".)

   c. Brainstorm: "What is the purpose of an organization chart?"

5. a. Visit a local business/industry and enquire about how the company is organized. If possible, obtain a copy of the company's organization chart. Share your information with classmates.

   b. Invite the owners/operators, managers of local businesses to discuss the purpose and the importance of planning and organization in their operations.

6. Develop a plan and an organization chart to show how the school lab or a workplace may be managed. Include positions for:
   - Manager
   - Shop foreman
   - Safety supervisor
   - Rotating responsibilities.

2. COMPONENTS AND COMPONENT SEQUENCE OF A TASK

Many tasks performed in related occupations are complex. The job sheets contained in the student workbooks show that each job procedure may be divided into a number of steps.

The ability to identify the components of a task and to place the components into the correct sequence are important skills in all occupations.

Suggested Activities/Community Partnerships

1. a. Working with two or three classmates, select a task or project that the group would like to complete in this course.

   b. Brainstorm and determine the tasks that will be needed to complete the project.

   c. Discuss the tasks and decide on the order in which they should be performed.

   d. Draw a flow chart to show the task order. (See Suggested Teaching Strategies, "Flow Charting: A Process Analysis Strategy".)

2. Identifying the components and component sequence of a task involves problem solving and decision making.

   a. Draw a model to show the method your group used to solve problems.

b. Draw a model to show the method your group used to make decisions. (See Suggested Teaching Strategies, "SCAMPER: An Idea Generating Strategy" and the *Program of Studies/Curriculum Guide 16-Level Occupational Component*, "Using the Problem-Solving/Decision-Making Model".)

3. Select one of the job sheets in your student workbook. Can you change the order of the steps in the procedure without altering the end product of the job? Rewrite the job sheet to show the new procedure.

C. TIME MANAGEMENT

Time management is an essential component of the planning process. Most workers are paid on the basis of the amount of time they spend on the job, at a work site, performing tasks. A frequently heard expression in the workplace is, "time is money".

Effective time management is an important skill in all occupations.

The concepts, skills and attitudes related to time management developed in this unit include:

1. Defines "time management".

2. Demonstrates dependability.

1. TIME MANAGEMENT DEFINED

Time management refers to how much work or play can be performed in a given number of hours, days, weeks, months or years. In many occupations, workers are expected to be at their workplace by a specified time, take breaks and lunch at specified times, and remain at work for a specified time. Failure to conform to time standards may result in job loss.

Suggested Activities/Community Partnerships

1. Visit two or three local businesses/industries and, by speaking with employees, obtain information about:
   - hours of employment
   - requirement for shift work
   - the possible consequences of poor time management skills (getting to work late, taking extra long breaks, taking days off).

2. Discuss:
   - What are the advantages/disadvantages of different work related time management approaches such as piecework, commission sales, hourly rates?
   - What is the relationship between time worked and productivity?

3. Given the choice of working and being paid at one of the following three rates, which rate would you choose? Why?
   - hourly
   - weekly
   - monthly

4. Some employers require employees to complete a daily or weekly time card to maintain a record of time of work. (See Resource 16, "Sample Time Sheet.) What are the advantages/disadvantages of time management system to:
   - employers?
   - employees?

2. DEPENDABILITY

Class attendance and tardiness records, as well as the student's ability to complete a task, provide the basic information about each student's dependability. However, dependability may be demonstrated in other ways in the home, the school, the community and in the workplace.

Suggested Activities/Community Partnerships

1. Brainstorm:
   - What does it mean when we describe a person as dependable?
   - Who are some of the most dependable people you know? Describe the behaviours that make you think of them as being dependable.

2. Discuss the meaning of "dependability" in the context of:
   - repairing cars on time
   - keeping people waiting for service
   - taking too long for a haircut; for a meal
   - not keeping appointments
   - following instructions.

3. a. What are the possible negative effects of dependable/undependable worker behaviour on the success of a business?

   b. Why is it important for supervisors in the workplace to be dependable?

D. TASK MANAGEMENT

Task management, like time management, is a component of the planning process. **Knowing what to do, how to go about it, and then doing it are important skills in all occupations.**

The concepts, skills and attitudes related to task management developed in this unit include:

1. Defines "task management".

2. Demonstrates willingness to learn.

3. Demonstrates interest in the occupational area.

1. TASK MANAGEMENT DEFINED

The ability to stay on task is a learned and complex skill which requires "STICKTOITIVENESS".

The ability to stay on task is frequently dependent on:

- the worker's knowledge of:
  - who wants the task done
  - what has to be done
  - how it has to be done
  - when it has to be done
  - where it has to be done.
- the worker's attitude toward:
  - work
  - the task
  - the person who asked for the task to be done
  - when and where may also be important.

Suggested Activities/Community Partnerships

1. Discuss:
   - What work do you enjoy doing? Why?
   - Can work be as much fun as play?
2. Design a chart or some other visual display that may be used to show task management skills (e.g., job sheets and other student activities completed, community partnership activities).
3. Invite community partners in related occupations to discuss:
   a. the importance of task and time management in the workplace

   b. the ways in which task and time management skills are evaluated in the workplace.

2. WILLINGNESS TO LEARN
3. INTEREST IN THE OCCUPATIONAL AREA

Both of these attributes are essential if a student is to progress to employment readiness in any occupational area. Employers have repeatedly indicated that entry-level workers' willingness to learn and their genuine interest in the work are more important than having specific work skills.

Encourage students to explore occupational areas through community partnerships about which they may have little or no knowledge. It is through exposure to the range of occupational clusters and occupations that I.O.P. students may be better able to select an occupational area that is of interest to them, and to demonstrate willingness to engage in further education and training.

Suggested Activities/Community Partnerships

1. Discuss:
   - How can a person looking for employment communicate to an employer that he or she is willing to learn and genuinely interested in working in the occupational area?

- How do employers communicate their need for employees who are willing to learn and genuinely interested in the occupational area?
- How do you show your teacher/supervisor that you are willing to learn and that you are interested in the course?

2. Look through the classified section of a local newspaper or business/trade journal and relate job/career advertisement to the careers section of your student workbook.

E. WORK STANDARDS

Work standards are systems of quality and control checks that are used by business and industry to evaluate:

- product quality
- service quality
- time management
- supply management
- salesmanship.

Students need to appreciate the purpose of work standards and be able to work to acceptable standards in the home, in school and in the workplace.

The concepts, skills and attitudes related to work standards developed in this unit include:

1. Defines "work standards".

2. Identifies work standards used in related occupations.

3. Appreciates need for control and quality checks.

1. WORK STANDARDS DEFINED
2. WORK STANDARDS IN RELATED OCCUPATIONS
3. CONTROL AND QUALITY CHECKS

Work standards are the quality, safety and sanitation checks that are used by business and industry to ensure efficient and effective operations. Work standards are usually established by people representing the following agencies:

- governments (i.e., federal, provincial, municipal)
- labour unions
- professional associations
- business and industry associations.

Work standards change over time. However, the standards generally used in business and industry can be categorized as follows:

Quality standards:

- product quality (e.g., saleability of the goods or services produced)
- process quality (e.g., organizational skills, service, salesmanship).

Safety standards:

- safe-use practices (e.g., equipment, tools and supplies)
- work area safety (e.g., control of noise, air, waste pollution, fire and accident safety procedures)
- safe storage and handling practices (e.g., control of hazardous products and wastes).

Sanitation standards:

- personal hygiene
- public hygiene.

Suggested Activities/Community Partnerships

1. Using your student workbook as a guide:

   a. list six work standards related to the course

   b. categorize each work standard as a quality, safety or sanitation standard.

2. Discuss one or more of the following questions, and relate the discussion to the effect of standards.

   - Why are work standards important?
   - Why do people have favourite shops, service stations, hairdressers, restaurants and so on?
   - What does it mean to have pride in one's work?
   - Is there a difference between salesmanship and service?
   - What is good service?

3. Draw a chart that may be used to evaluate work standards in the school lab or in the workplace. Use the chart to evaluate your own performance.

4. a. Identify a local business that you believe operates with good work standards.

   b. List the work standards you believe they use.

   c. Suggest why you believe the work standards used are good or bad.

ETHICAL CHARACTERISTICS OF BEHAVIOUR – EVALUATION CHART

On the last school day of each month evaluate your ethical behaviour against the characteristics listed below. Compare your evaluation with the evaluation given by your teacher/supervisor.

Key:
Excellent = 5
Very Good = 4
Fairly Good = 3
Not So Good = 2
Poor = 1

Ethical Characteristic	STUDENT'S AND TEACHER'S/SUPERVISOR'S EVALUATION																			
	Sept.		Oct.		Nov.		Dec.		Jan.		Feb.		Mar.		Apr.		May		June	
Dependability																				
Enthusiasm																				
Honesty																				
Cooperation																				
Courtesy																				
Self-control																				
Hard work																				
Initiative																				
Loyalty																				
Adaptability																				
Patience																				
Tact																				

Has your ethical behaviour improved during the course? ______________________________

Where has your ethical behaviour changed the most? Why?

____

____

____

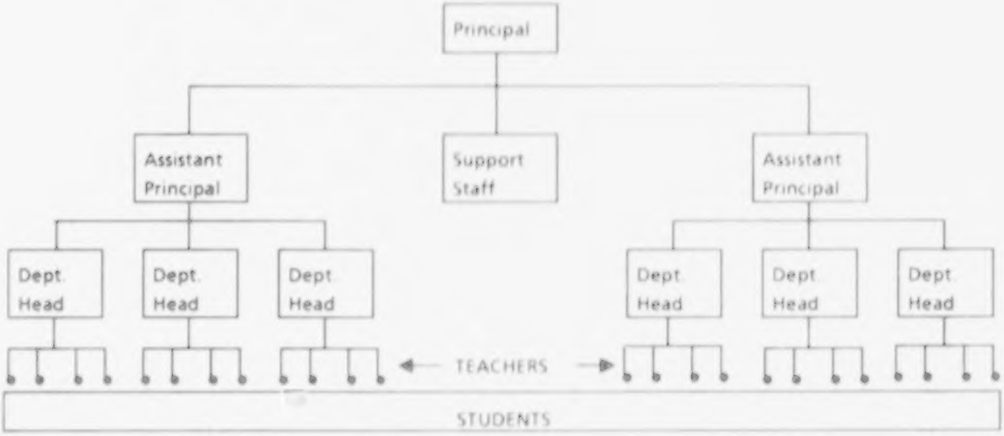
____

____

Student's Signature ______________ Teacher's/Supervisor's Signature ______________

SAMPLE ORGANIZATION CHART

The following chart shows the way some high schools are organized.


Principal
Assistant Principal
Support Staff
Assistant Principal
Dept. Head
Dept. Head
Dept. Head
Dept. Head
Dept. Head
Dept. Head
TEACHERS
STUDENTS

Use the space below to draw an organization chart to show the organization of your school?

SAMPLE TIME SHEET

TIME SHEET

EMPLOYEE:

Social Insurance Number:

Week Ending:

MORNING		AFTERNOON		EVENING		HOURS
IN	OUT	IN	OUT	IN	OUT	

	HOURS	RATE	EARNINGS	
REGULAR				
OVERTIME				
TOTALS				

3. COMMUNICATION SKILLS

> "Very simply, communication is a message sent and a message received; ideally these two messages would be identical, but seldom are."[1]

Maintaining a good communication system is important in all occupations. Any breakdown in communication can have implications on a worker's ability to do a job and on the company's ability to reach its objectives. If directions are not fully or clearly given, workers may not understand the exact procedures that must be followed or be aware of the specific materials that should be used. In order for work to be done correctly, workers need to seek clarification if they have not understood or are unsure about certain procedures or methods in their work.

TEACHERS OF STUDENTS IN OCCUPATIONAL COURSES SHOULD INTEGRATE THEIR INSTRUCTIONAL PLANNING WITH TEACHERS OF ENGLISH, TEACHER LIBRARIANS, AND COMMUNITY LIBRARIANS.

Effective verbal and non-verbal communication ensures that information:

- flows in all directions
- is clearly understood by both the sender and the receiver
- is acted upon or responded to as quickly as possible.

The development of effective and appropriate communication skills is an integral part of each course within the Integrated Occupational Program.

The concepts, skills and attitudes related to communication developed in this unit include:

1. Defines "communication".
2. Identifies types of communication.
3. Recognizes the relationship between verbal and non-verbal communication.
4. Follows verbal instructions.
5. Asks questions.
6. Recognizes occupation related communication techniques.

RESOURCES

STUDENT RESOURCE

- *Working: Today and Tomorrow*, Canadian Edition. Toronto, Ontario: Irwin Publishing, 1990.

Correlation of Learning Objectives with Student Resource

Concepts, Skills and Attitudes	*Working: Today and Tomorrow*
3. Communication Skills	Chapter 10 "Getting Along with Others"

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[1] For permission to reprint copyrighted material, grateful acknowledgement is made to Alberta Agriculture for the excerpts from "The Communication Tool Kit", page 4.

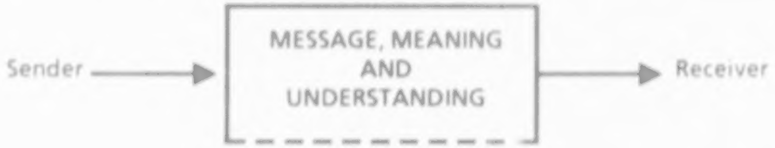
TEACHER RESOURCES

- Resource 17, "Forms of Non-verbal Communication"
- Resource 18, "Job Related Communication (Jargon)"
- Resource 19, "The Communication Tool Kit", Alberta Agriculture
- Language Arts, Career and Life Management, Drama, and other teachers
- Community partners.

1. COMMUNICATION DEFINED

Although communication may appear to be simple, it is in fact a complex process. Communication includes all techniques in which a message is sent and received.

Communication may be represented by the diagram below:



Effective communication is achieved when the sender's message and meaning are understood by the receiver.

For effective communication to occur, the receiver should be able to restate both the words and the intent of the sender's message. In this context, the ability of the receiver to develop good listening skills is of the utmost importance. (See Suggested Teaching Strategies: "CARING: A Listening Strategy".)

The frequent problem is that the receiver receives and understands the words but not their meaning.

Suggested Activities/Community Partnerships

1. Brainstorm and list examples of misunderstood word meanings.
2. a. Discuss the problems of "mixed messages", "mixed meanings" in jobs related to the occupational area.

   What are some possible consequences of misunderstanding messages in related situations:
   e.g., receptionist taking appointments?
   stockperson taking orders?
   salesperson trying to sell a product?
3. Role play effective and non-effective communications. Include examples of verbal and non-verbal communication and mixed messages.
4. Ask community partners to recount their most embarrassing miscommunication and how they handled the situation.

2. FORMS OF COMMUNICATION
3. VERBAL AND NON-VERBAL COMMUNICATION

Communication takes many forms. The basic strands of communication include:

- listening
- reading
- speaking
- viewing
- writing.

Using one or a combination of these strands, information is transmitted between people through both verbal and non-verbal forms of communication including:

- newspapers
- magazines
- radio
- television
- video and audiotapes
- video discs
- noise
- touch
- appearance
- eye contact
- facial expression
- gestures
- posture
- distance between sender and receiver tone and voice.

Suggested Activities/Community Partnerships

1. Discuss:
   - How do we communicate with others?
   - Is the message sent always the same as the message received? Why or why not?

2. Non-verbal communication involves sending messages using written words, signs, symbols, and body language.

   a. Brainstorm to identify the various ways by which we communicate non-verbally.

   b. Use Resource 17, "Forms of Non-verbal Communication" to categorize the responses.

3. Experts in communication suggest that the meaning of a message is communicated 30% through verbal cues and 70% through non-verbal cues.

   a. What effect might this have on the way you communicate
      - at home
      - in school
      - in the workplace.

   b. List examples of how you communicate both verbally and non-verbally in each of these locations.

4. Role play non-verbal forms of communication that may be used in school and in the workplace.

4. FOLLOWING VERBAL INSTRUCTIONS

The ability to follow verbal instructions is a necessary skill in all occupations. I.O.P. students may exhibit some difficulty in responding to verbal instructions due to memory and sequencing deficiencies. The following strategies are suggested to assist them:

- Post rules, instructions, critical procedures on walls to serve as an external and continuous memory support.

- Promote an atmosphere that is supportive of the student responding to questions from the teacher or peers.

- Teachers' questioning strategies should probe both for students' understanding of the instructions and the transfer of the instructions into sequenced action.

- Have students respond to questions beginning with the following phrases:

  - State in your own words . . .
  - What does it mean to . . .?
  - What will happen if . . .?
  - What is the next step?

Suggested Activities/Community Partnerships

1. Explain and demonstrate to a classmate the sequence of a specific task outlined by the teacher/supervisor.

2. Practise using memory-jogging strategies (e.g., mnemonic devices, listening strategies). See Suggested Teaching Strategies:
   - "CARE – A Safety Strategy"
   - "CARING – A Listening Strategy"
   - "First Letter Mnemonic"
   - "LEEP, CHECK Oral Presentation Strategies"

3. Using a problem related to the course, tell the class:
   - What's the problem?
   - What's the plan?
   - What's being done?
   - What can be done?

4. a. Invite a community partner to discuss the importance of being able to follow verbal instructions in the workplace.

   b. Some occupations use their own language (jargon) to communicate on the job.
      - Is jargon used in course related occupations?
      - Give examples of the jargon and how and when it is used.

5. ASKING QUESTIONS

The willingness of students to ask questions is indicative of their desire for more information. Students should be encouraged to ask questions when they have a need for:

- further direction
- feedback
- more detail
- examples
- clarification.

Suggested Activities/Community Partnerships

1. Brainstorm: If you were looking for part-time employment, what questions would you ask an employer? Other employees? Others?

2. Practise the technique of selling via the subliminal question; e.g.,
    - Would you like your backyard cleaned up after I've tended to the snow removal?
    - Would you like the car washed while it's in the shop?
    - Would you like to try some accessories with the garment?

3. Role play situations involving verbal interchanges; e.g.,
    - telephone sales
    - taking appointments
    - dealing with a dissatisfied customer
    - requesting a job interview.

6. JOB RELATED COMMUNICATION (JARGON)

Every trade and occupation has its own "jargon" or "lingo" – a community of commonly understood words. Support the notion that learning the "lingo" or the "jargon" of a trade will assist students in their transition from the school to the workplace.

Suggested Activities/Community Partnerships

1. Communicate with local people in various related occupations and attempt to identify at least six words of jargon common to each occupation. List the words and their meaning. Use Resource 18, "Job Related Communication (Jargon)".

2. Discuss:
    - What is the purpose of jargon?
    - Does the use of jargon help or hinder communication? Explain your answer.
    - What effect does the use of jargon have on human relations in the workplace?

    (Resource 19, "The Communication Tool Kit", Alberta Agriculture may be used to provide additional student activities.)

FORMS OF NON-VERBAL COMMUNICATION

1. What forms of non-verbal communication do we see each day at home, in school, and in the workplace?

2. Think about each of the forms and list each form under one of the following headings.

Heard	Spoken	Written	Viewed	Body Language
e.g., bell	scream	sentence	TV soap opera	gesture

3. Some forms of non-verbal communication may be listed under two or more headings. List them under each of their headings in the section below.

4. Some forms of non-verbal communication may be combined with verbal forms of communication. List two examples.

JOB RELATED COMMUNICATION (JARGON)

1. List at least three occupations that relate to the course.
2. Visit a job site appropriate to each occupation and enquire about the trade/occupational jargon.
3. List at least six words or terms of jargon common to each of the three occupations and give the meaning of each word or term.

Student: ____________ **Course:** ________________________

Occupation	Jargon	Meaning

Communication Tool Kit

Communication Tool Kit

Information prepared by:

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COMMUNICATION TOOL KIT

"If a word can be interpreted more than one way, it probably will be."
Murphy's law on communication.

INTRODUCTION

Much has been written about farming as a high stress occupation. Other articles are concerned with the continuation of the family farm unit. In almost all of these works, problems in family communication have been mentioned. Our rising divorce rate is further evidence that couples are having difficulty. This booklet is a method of introducing basic communication skills to the farm family.

While this booklet is directed specifically at farm couples, to be used in the privacy of their own home, the tools discussed in it are relevant to any relationship.

WHAT IS COMMUNICATION?

Very simply, communication is a message sent and a message received; ideally, these two messages would be identical, but seldom are.

We communicate all the time, even when we would rather not. Effective communication narrows the gap between the message that is sent and the message that is actually received by the other person.

The messages can involve facts, feelings, thoughts, impressions, sensations, needs, or wishes or any combination of these.

The tools of effective communication are simple to talk about but much more difficult to use; unlike hammers and chisels you cannot hold them in your hand and wield them. However, you can see these tools if you know what to look for; like other tools, these need to be used consciously, maintained, even honed.

Here is an example where the speaker thought a clear message was sent.

> One lady left a note for her husband reading: "At Betty's, hot dogs for supper." A friend paraphrased, "You are visiting Betty. Because you will be home late, you plan to make hot dogs when you get home." That was, in fact, her meaning. However, her husband arrived at Betty's with a supply of weiners and buns and annoyance!

Think of similar instances that have happened in your home.

EMOTIONS

It is important to understand that human beings are in a state of emotional arousal, of greater or lesser intensity, throughout life. Originally, emotions were given to us for survival purposes. If danger threatened, the flight/fight emotions spurred us to action. Affection probably welded a family unit together for mutual protection and benefit. Sexual desire ensured the continuation of the species.

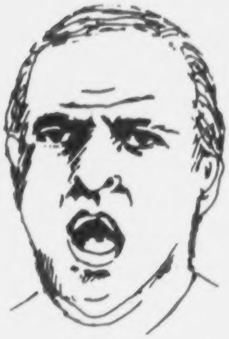
As our brains, and then our societies, became more complex, we functioned more and more with learned behaviour. Our emotions, very likely, became more and more complex and were governed increasingly by our thoughts and beliefs. At present, for example, in Canada the situations in which we perceive threat are unlikely to involve immediate physical danger. A perceived threat is more likely to involve our status, our financial stability, our self esteem.

Further, in the process of trying to live together, we learned a lot of rules about how we were supposed to feel. We ignore, neglect, discount, rationalize our feelings.

Example: How many times have we decided to think about something else so we can "calm down."

Some of these rules need to be discarded for our own good.

It is suspected that men die sooner than women in part because they are taught to bottle up emotional expression.



"I'm not angry."

Example: Only sissies cry.

Many people believe that if you feel a certain emotion, action must follow (e.g., anger leads to destruction). In fact, if you learn that it is permissible to feel the whole range of emotion and you learn how to express emotion appropriately, the chances of an emotion getting you into trouble decrease immediately. This booklet is really addressed to your expressing yourself appropriately.

RISKS

It would be foolish to deny that risks exist for people who use the tools of effective communication.

- One of the tools in your effective communicator's tool kit is **the ability to determine what you want and ask for it directly.** That leaves the other in the position of saying, in effect "Yes, I will grant your request", or ", I won't." This is a risk if giving someone else this power scares you.
- If you have grown up believing that emotion is to be avoided, that discussing things "rationally" was the only right way, then there is a risk for you. Someone will become emotional. In fact, **effective communication involves the recognition of emotion and the appropriate expression of it.** Many people fear that openness may lead to anger, others find a threat in the possibility of greater intimacy and caring.
- You may find out something about your partner you **really would prefer not to know.** For example, if your heart craves a new tractor, you may be oblivious to her desire for carpet. If you want a dishwasher, you may want to remain ignorant of his mad passion for a ski doo.

This may be difficult to believe, but the risk of damaging the relationship is greater if these issues are not resolved.

Think of a time when you decided not to speak up because you were unsure of the results.

Not everything that is faced can be changed,
But nothing can be changed until it is faced.
(James Baldwin in Looking Out/Looking In.)

BENEFITS

The benefits of sharing, understand, trust, and openness are far reaching for the whole family.

- The level of **self esteem** rises in all family members. Listening conveys powerful messages: you are important, I care about you, you have a right to your feelings, you are OK, you count, you are lovable, you are capable.

- People with healthy levels of self esteem are pleasant people. They **function well** in a situation. They make **effective decisions.** People with poor self esteem can be miserable and demanding. They think only of themselves. Why not? Nobody else is thinking of them. Families have a stake in listening to their members. Being heard is good for everybody.

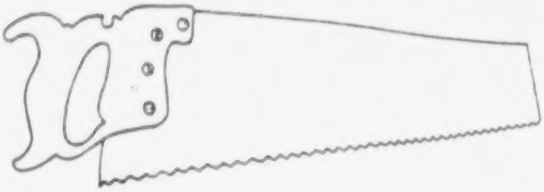
- People are social beings – they need care and attention from other people. Humans **must have attention**; they will settle for negative attention if they lack supportive, positive attention.

- Conflicts that are ignored do not go away – they go underground, where they behave like polluted ground water. Conflicts dealt with openly, negotiated as **differing needs**, can lead to greater sharing and intimacy. Very simply, the tools of effective communication can be used to build a healthy atmosphere for growth of any relationship.

- Sending clear messages pays off when you are teaching your children. Learning is so much easier for them.

Think of a situation when you learned something new from someone else. What helped you learn? What was not helpful?

BARRIERS



As there are certain conditions that govern your decisions on the farm (e.g., soil pH), so there are certain conditions to be aware of in communication.

1. Filters of Perception

Filters are those aspects of ourselves through which we put all the communications that come to us: our senses, our experiences, our memories, our beliefs, our values, our emotional state, our physiological state. Since we are bombarded all the time by far more sensations and messages that we can possibly assimilate, we must select a focus. Have you ever noticed after you have had a certain experience that you become acutely aware of other people who have had the same experience. If you are having your first child, you notice pregnant women; if your favourite uncle has cancer, the disease seems suddenly to increase all over Canada. Our attention has been focussed.

2. Prejudices

The word prejudice in itself comes with a certain set of mind. To be prejudiced is to be bad, right? The Dictionary of Canadian English says of prejudge: "to judge beforehand or judge without knowing all the facts." Prejudice is defined there: "an opinion formed without taking time and care to judge fairly." However, human beings, by the very way we process information, must prejudge; it is the only way we can operate.

If you see Illustration #1 you would likely say it is a horse.

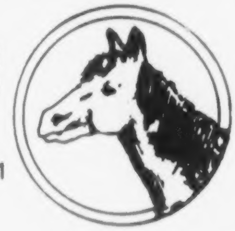


Illustration #1

While Illustration #2 has very little resemblance to #1, you will undoubtedly label #2 "a horse" as well.

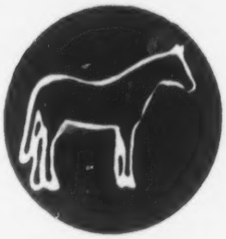


Illustration #2

They fit a **concept** you already have; if you have had any experience at all with a horse, you can already make a prediction about what to expect when you next meet a horse and about how you will act towards it.

If we did not form concepts and make predictions, (i.e., prejudge) we would be unable to function. Our inner world would be chaos. Our prejudices make trouble for us only when they are made on too little information, when we are not aware of them, and when we do not keep them tentative and open to new information.

3. Timing and Time

It takes time to use hammers and wrenches and it takes time to use the tools of communication. Don't hit and run. There are appropriate times to repair machinery and appropriate times to communicate – it is definitely unwise to express your displeasure about muddy footprints to your spouse until his frustration has subsided from the baler break-down. His highly charged emotional state really does affect his hearing.

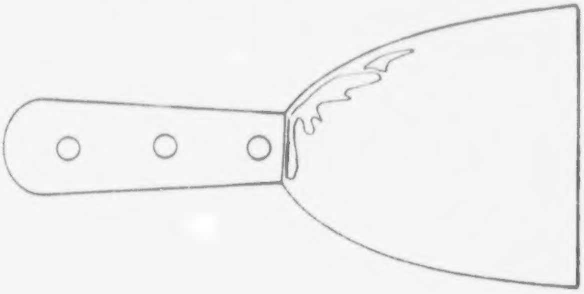
4. No-No's

- Don't go off on tangents or dredge up the past.
- Don't bring in allies or demand that by-standers take sides.
- Don't give advice, unless you have been asked.
- Don't use labels, positive or negative. Name calling is out. When feelings are hurt, the goal can become retaliation, not negotiation.
- Don't try to divert, humour, or reassure without first demonstrating your understanding by reflective listening.
- **Do** use the same courtesy as you would in dealing with a friend, **one you wanted to keep.**

COMMUNICATION SKILLS

Just as you use a shovel for one purpose and a pitchfork for another, you need to learn which communication skills to use in the situation at hand. If the **other** person is upset, has information to convey, has needs to be met, has a problem, then you are the receiver and you use **reflective listening**. If **you** have the problem, the needs, the information, then you use all the tools you need for **accurate sending**. If you **both** have needs, particularly if they are in conflict, then bring your whole tool kit into play in **negotiation**.

If there is one problem that can be pinpointed as being most common, it is the inability of people to determine **"who has the problem?"** The second most common is in defining "what is the problem?" The answers to those two questions are not always as obvious as we think they are.



1. Non Verbal

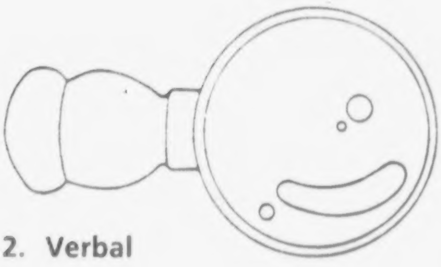
While words are very important in conveying information, in many communications the message comes from:

body posture and gestures:	70%
tone of voice:	20%
words:	10%

So be conscious of what you see (more will be said about describing that) and how you are expressing yourself. Do the elements match? Do his words match what you see and hear? Do your words match what he is seeing and hearing?

Practice – to heighten your awareness of the importance of physical aspects of communication:

- Have one of the partners choose a topic. Before starting the discussion, stand up back to back with about six inches between you. Now start the conversation. Pay attention to how you feel in this position and to any movements you make. Do you find yourselves craning to see each other?
- Now, continuing to talk, turn to face one another, but close your eyes. How does that feel? What do you notice about your reaction?
- Still continuing to talk, open your eyes and, facing each other, move to opposite sides of the room. What changes do you notice?
- Now, continuing to talk, find a comfortable position to finish the conversation. Many people will find themselves, at this point, seated near one another, in good eye contact. This is the "I'm listening" body posture. Remember this position.



2. Verbal

a) Words

Despite carrying only 10 percent of the message, words are vitally important. Many times our choice of words muddies up our messages. One of our most common habits is the use of generalities – if you use generalities, you will think in generalities, and relate that way.

> Example: "I have had a rotten day." This statement leaves the speaker feeling frustrated and depressed, and the listener unenlightened. In fact, this was how the day actually went:

> "I got up a half hour late this morning, so the children had to rush to catch the bus without lunches. I ended up having to take the lunches to town. At least, I was able to eat with the kids. I did my shopping – groceries have gone up in price – and a bunch of errands. Supper was late and everyone was clamoring."

As the speaker focussing on the details, would you feel the same about the day as before? As the listener, compare your initial reactions to the two messages. When you take time to look at the details, you realize there were both positive and negative aspects to the day.

Words can confuse, rather than clarify. We may choose words that:

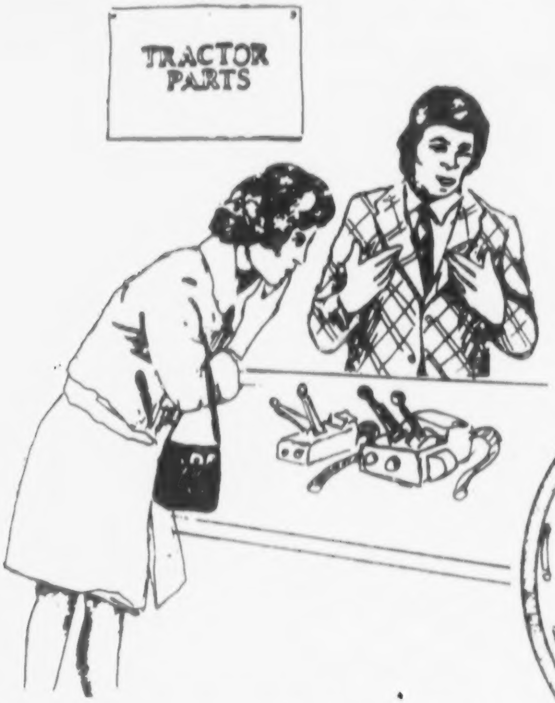
1. have more than one meaning (husky, crunch, gay even turkey – every page in the dictionary would yield examples)
2. are relative (big, small, cold, warm – compared to what)
3. announce an attitude rather than describe (antique or second-hand, character lines or wrinkles)
4. are overly broad (all, never)
5. make "motherhood" statements (liberty, equality, freedom).

Next time you hear someone making a speech, ask yourself what the person really means in terms of day-to-day action. The chances are 99 to 1 that you will not know.

Be specific. Some writers talk about "operational definitions". These are definitions that are so specific that you have no doubt what is meant. A good example is a recipe. Be as specific as you can.

Practice – Each partner does this separately and then compares:

i. Make a list of five words that have at least two meanings.
ii. Make a list of five words that have only one meaning, are very specific. Does your partner agree with your meaning?



"Let's see, is it your turn or my turn to guess what size he wanted?"

b) Reflective Listening

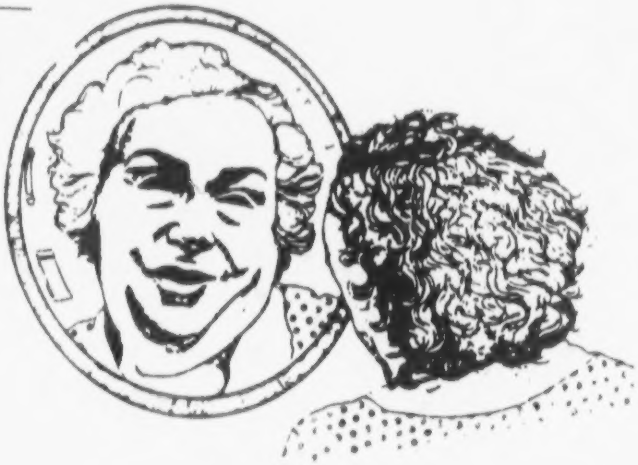
All messages – even those that appear most factual – have two components:

$$\frac{\text{content}}{\text{feeling}}$$

The concept, reflective listening, is simple; the practice is not. We all have ingrained habits that interfere: giving advice, answers, admonitions. We believe we should fix things so people will feel better. Your first attempts to use reflective listening will feel strange, frustrating.

A reflective listening response involves paraphrasing the content – putting it in your own words – and making a tentative statement about the feelings of the speaker (perception check). It is not always appropriate to deal with feelings (e.g., if I ask you what time it is, it is more appropriate to look at your watch and tell me). However, it is frequently useful to repeat the message to make sure you have it, just as you would repeat a phone number.

> Example of reflective listening:
> Speaker: I work hard around here but it seems nothing I do is enough.
> Reflective listening response: You feel discouraged; you wish somebody (I) would show some appreciation.



Practice – In the following exercise, pretend one of your family is speaking. Ask yourself "how does the speaker feel right now?"

Practice Your Listening Skills

Directions: Often people say much more than the words or ideas. Behind the words lie feelings. Try to determine the feeling or feelings you think the person has in each of the statements on the next page (there may be more than one feeling in each statement).

* * *

Practice Your Listening Skills

Speaker Says	Speaker is Feeling
EXAMPLE: I can't figure out what's wrong. Nothing seems to go right. Maybe I should just give it up.	(a) Discouraged (b) Stumped (c) Tempted to give up
1. Boy, am I glad there are only 40 acres left to harvest.	
2. Hey Dad, look at the airplane I made with the tools you gave me.	
3. I really don't think I'll pass my driver's test.	
4. This is such a dull day that I just haven't any energy. And I have all this work sitting here.	
5. I'll never succeed in pleasing you. I try and try but nothing ever seems good enough.	
6. That new teacher sure gives us too much homework. I can't get it all done. What am I going to do?	
7. Everybody is away on holiday but us.	
8. I finally learned how to turn that baler properly.	
9. I wish I hadn't argued with my mother-in-law. Now she likes me even less than she did.	
10. I'm going to wear my hair the way I like it. It's my hair, isn't it? I like it this way.	
11. How do you think I'm doing? Do you think the job is good enough?	
12. How come I'm the only one who ever picks anything up around here?	
13. I'll do it myself. I don't need your help.	
14. These tax forms are so complex. I guess I'm just too stupid to do them right.	
15. Go away and leave me alone. I don't want to talk to you or anybody. Besides you don't care about what happens to me.	
16. At one point, we were doing okay but with these beef prices! You can work yourself sick. I just wonder whether it is worth it.	
17. I would like to work on the Rink Committee. I'm sure I could do a better job than those guys. But what if I can't?	
18. When I tell you to shut the gate I don't mean next week. Get your *!X* after those cattle.	
19. Honey, you look great. That dress you made is really pretty.	
20. Do you think we should ship the hogs now or gamble on that raise in price they're predicting?	

How Did You Score?

Directions: Give yourself a 4 on those items where you feel your choices closely match those listed below. Score yourself a 2 on items where your choices only partially match or where you missed one feeling of the several indicated. Give yourself a 0 if you missed altogether. How close did you come?

SCORE

1. (a) Glad
   (b) Relieved ______
2. (a) Proud
   (b) Pleased ______
3. (a) Scared
   (b) Unsure ______
4. (a) Bored
   (b) Lethargic ______
5. (a) Inadequate
   (b) Discouraged ______
6. (a) Discouraged
   (b) Feels defeated
   (c) Incapable ______
7. (a) Envious
   (b) Lonely ______
8. (a) Proud
   (b) Competent ______
9. (a) Guilty
   (b) Regretful ______
10. (a) Resentful
    (b) Independent ______
11. (a) Some Doubt
    (b) Unsure ______
12. (a) Angry
    (b) Unfairly treated
    (c) Dislike ______
13. (a) Resentful
    (b) Independent ______
14. (a) Frustrated
    (b) Feels inadequate ______
15. (a) Hurt
    (b) Angry
    (c) Unloved ______
16. (a) Discouraged ______
17. (a) Wants to go
    (b) Afraid ______
18. (a) Angry
    (b) Upset ______
19. (a) Pleased, proud
    (b) Appreciative ______
20. (a) Uncertain, unsure ______

YOUR TOTAL SCORE ______

Your Rating for Recognizing Feelings:

61 – 80	Outstanding recognition of feelings
41 – 60	Better than average recognition of feelings
21 – 40	Below average recognition of feelings
0 – 20	Poor recognition of feelings

Practice – Keeping in mind that reflective listening is the tool of choice when the other person has the message. Next time your partner seems upset or harassed or happy, try reflective listening. Remember: the format of a reflective listening response is "I hear you saying __________ and you are feeling __________". It will feel awkward at first but just watch your results. Talking will increase when listening is on target. The speaker will feel accepted, significant.

Reflective listening sounds both easy and passive. It is, in fact, neither. There may be times in your life when it will be the greatest gift you can give another.

c) Accurate Sending ("I" message)

In addition to reminding you to reread the section on "words" on page 9 we will deal with what some writers call "I" messages. Positive "I" messages (appreciation, recognition) may take the form: I (feeling words) when you (behaviour description), and sometimes add a payoff description.

> Example: "I really appreciate your putting the groceries away. It's a job I hate."

A negative "I" message (one that confronts or asks for a change) may take the form: I (feeling words) when you (behaviour description), I would like you to (behaviour description of alternative desired).

> Example: "I really get embarrassed when you make sarcastic comments to me in front of my friends. If you are annoyed with me, I would like you to tell me that directly. I frequently don't know what I have done that upsets you."

i. Feeling or Thinking

When you are discussing an emotional issue, as opposed to a hardnosed business decision, it is important to know the difference between a feeling, a thought, an opinion, or a belief. This distinction becomes important in distinguishing a "you" message from an "I" message. this is not an artificial distinction.

> Examples: "You" message: "I feel you should be more thoughtful." "I" message: "I resent it when you walk across my clean floor with muddy boots."

"You" messages are judgemental, make people defensive, feel badly about themselves, and are much more likely to start fights in the family. "I" messages share information about feelings. "I" messages avoid labelling the listener.

ii. Sending Clear, Honest Messages About Feelings (the "I" message)

We learned many rules as we were growing up that make it difficult for us to level with other people about our feelings and our needs and about how their actions are affecting us. Do these injunctions sound familiar?

- If you can't say something nice, don't say anything at all.
- You shouldn't hurt other people's feelings.
- It isn't nice to argue.
- It isn't polite to ask.
- It is selfish to use "I" all the time.

Think about some other rules you have learned about feelings.

In effect, to learn to use "I" messages successfully, we need to learn some new rules:

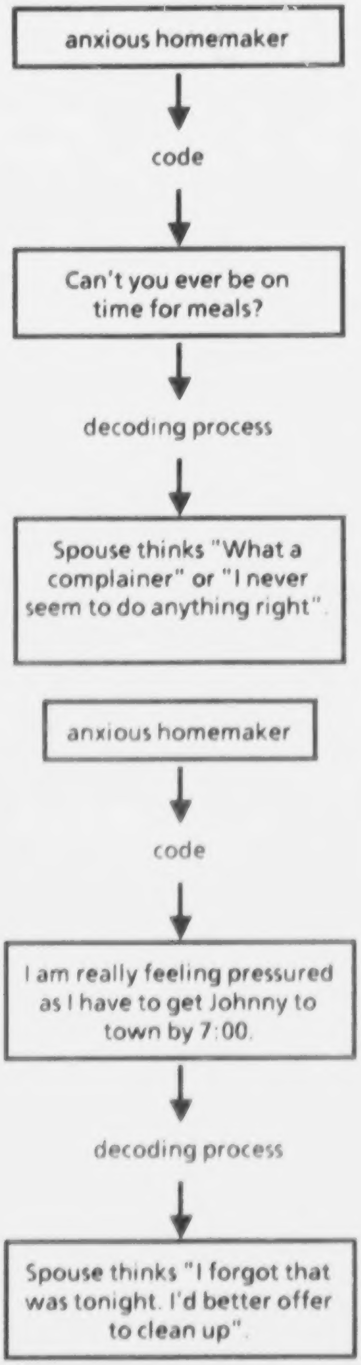
- It is okay to feel and to recognize what I am feeling.
- It is okay to have needs.
- It is okay to ask for things.
- Other people can survive hurt feelings (if, in fact, my asking for my needs hurts them); after all, don't I survive my hurts?
- Feelings are not actions.

When your spouse's actions interfere with your needs, it is most productive to tell him/her in such a way that he/she really understands the problem. Too often, we ourselves are not clear about the origins of our feelings and we tend to send fuzzy, unclear, or put-down messages which result in the recipient immediately becoming defensive:

- You have left tracks all over, you're so inconsiderate.
- Can't you ever be on time for meals?

Those are "you" messages and usually they can escalate any minor annoyance into a battle in two minutes. If we simply state our feelings about some behaviour, this is usually an "I" message – much less potential for major war.

To illustrate:


anxious homemaker
code
Can't you ever be on time for meals?
decoding process
Spouse thinks "What a complainer" or "I never seem to do anything right".
anxious homemaker
code
I am really feeling pressured as I have to get Johnny to town by 7:00.
decoding process
Spouse thinks "I forgot that was tonight. I'd better offer to clean up".

Practice – In the following exercise, please indicate which of the statements are clear "I" messages, statements of feeling. Circle a, b, c or as appropriate.

"I" Messages Exercise

(– adapted from John L. Wallen, Northwest Regional Educational Laboratory, Portland, Oregon.)

1. a) You aren't so smart yourself.
   b) I am really hurt by your criticism.

2. a) Can't you see I'm busy?
   b) I am frustrated because I have too much to do and now you are asking me to rush to town for parts.

3. a) I feel discouraged because I had a disagreement with mother and then I lost my temper and shouted at my child.
   b) This has been an awful day.

4. a) You're a wonderful person.
   b) I am thrilled with the Christmas gift you gave me.

5. a) I feel so comfortable with you, I can talk to you about anything.
   b) We all feel you're a wonderful person.
   c) Everyone likes you.

6. a) If things don't improve around here, I'll look for a new job.
   b) I'll bet we will have another dry year just because we planted that speciality crop!
   c) I am really anxious because we are depending on that crop for money to renovate the house.

7. a) This is a poorly built piece of machinery.
   b) I feel this is a poorly built piece of machinery.

8. a) I feel inadequate when I get up in front of a group to speak.
   b) I am inadequate in speaking in front of a group.

9. a) I am a failure – I'll never amount to anything.
   b) That teacher is awful. He didn't teach me anything.
   c) I'm depressed because I did so poorly on that test.

10. a) I feel lonely and isolated in my family.
    b) For all the attention anybody pays to what I say I might as well not be in my family!
    c) I feel that nobody in my family cares whether I'm there or not.

Discussion of Responses to "I" Messages Exercise

1. a) No. Commands such as these convey strong emotion without describing what kind of feeling underlies the negative response.
   b) Yes. The speaker describes himself as feeling hurt

2. a) No. The question conveys strong feelings but does not describe what it is.
   b) Yes. The speaker's feeling is described as frustration.

3. a) Yes. The speaker describes herself as feeling discouraged. We also have information about what happened.
   b) No. Conveys negative feelings without describing what they are. The statement appears to tell what kind of day it was when, if fact, it is an expression of the way the speaker is feeling. We cannot tell from an expression like this whether the speaker feels depressed, lonely, humiliated, or what, and we certainly don't know what happened.

4. a) No. A value judgement that expressed positive feelings about the other without describing what they are. Does the speaker like the other, respect him, enjoy him, admire him, love him, or what? He does not say.
   b) Yes. The speaker leaves no doubt about the pleasure the gift brought – encouragement for further gift giving!

5. a) Yes. A clear description of how the speaker feels with the other.
   b) No. "You're a wonderful person" is a value judgement and not a description of feeling. Secondly, the speaker does not speak for himself but hides behind the phrase "we feel".
   c) No. It is true that a feeling is named in the statement but the speaker refers to everybody and does not make clear that the feeling is in him. A description of feeling must contain "I", "me", or "mine" to make clear that the feelings are the speaker's own; that they are in him.

Does it seem more affectionate to you for a person to tell you "I like you." or "Everybody likes you."? Do you find it more difficult to tell another "I like you." or "Everybody likes you."?

6. a) No. Conveys negative feelings by talking about the condition of things instead of about the speaker's inner state.
   b) No. A statement that expresses a negative value judgement about the weather but does not describe what the speaker is feeling.
   c) Yes. A clear description of how the speaker feels in relation to the farm. He/she feels anxious.

Expressions a and b are comments that could come from the kind of anxiety described in c. Many expressions of anger are the result of fear, hurt feelings, disappointment or loneliness.

7. (Trick question) a) No. A negative value judgement or opinion. It conveys that the speaker has negative feelings but does not say what kind they are.
   b) No. Although the speaker begins by saying, "I feel . . ." he does not then tell what he is feeling. Instead he expresses a negative value judgement. Note that merely tacking the words "I feel" on the front of a sentence does not make a description of feeling. People

often say "I feel" when they mean "I think" or "I believe" for example, "I feel the Stampeders will win", or "I feel it will rain tomorrow".

The speaker could have said that he felt disappointed, frustrated, or angry. While he is entitled to express his opinion, it is useful to realize that it is not a direct expression of feelings.

Many persons who say they are unaware of what they feel habitually state value judgements about others and about things without recognizing that this is the way their positive or negative feelings get expressed.

8. a) Yes. Describes himself as feeling inadequate.
   b) No. Careful! This sounds much the same as a. However, it says that the person actually is inadequate, not just feels this way. The speaker has passed a negative judgement on himself and labelled himself as inadequate.

This subtle difference was introduced because many people confuse feeling inadequate with being inadequate. A person may feel inadequate when doing a certain task and yet do an excellent job of it. Likewise, he may feel adequate and competent in a subject and yet perform poorly.

One sign of emotional maturity may be that a person can perform adequately even when he feels inadequate to the task. He does not let his feelings keep him from doing the best he can because he knows the difference between feelings and performance and that the two do not always match. See item 9 about labels.

9. For the parents out there
   a) No. The speaker has passed judgement on himself and labelled himself a failure. The statement does not describe what he is feeling.
   b) No. Instead of taking it out on himself, the speaker blames the teacher. This is another value judgement but not a description of feelings.
   c) Yes., Conveys feeling by describing the speaker's emotional state – he feels depressed.

Expressions a and c illustrate the important difference between passing judgement on oneself and attaching a label and describing one's feelings. Feelings can and do change. To say that I am depressed does not imply that I will or must always feel the same. However, if I label myself a failure – if I truly think of myself as a failure – I increase the probability that I will act like a failure. Ask yourself if you use labels in thinking of yourself – or others.

10. a) Yes. Conveys feelings by describing the speaker as feeling lonely and isolated.
    b) No. Conveys negative feelings without telling whether the speaker feels angry, lonely, disappointed, hurt or what.
    c) No. Instead of "I feel" the speaker should have said "I believe". The last part of the sentence really tells what the speaker believes the others feel about him and not what he feels.

Expressions c and a relate to each other as follows: "Because I believe that nobody in my family cares whether I am there or not, I feel lonely and isolated".

It is not easy to send good "I" messages. Many first attempts are really disguised "You" messages. "I feel you are thoughtless" is a good example. It is a loser for several reasons. It is an opinion ("I think" is more accurate), makes a negative judgement, and is fuzzy to boot. If, in fact, the listener wanted to change his behaviour, where would he start?

The other skill we must learn in sending clear, honest messages is **behaviour description**. So often we give opinions and judgements about what we see happening, instead of describing what we do see and hear. Many times, too, we are not specific enough and we make the assumption that the listener knows what we mean when we have not given enough information.

Practice

1. Make a game for the whole family of describing their actions as you see them. Be very specific. Example: Jimmy, I see you picking up your glass, putting it to your lips. I see the milk disappearing. Pretend you are on the witness stand and are only giving the facts.

2. Give specific instructions about doing a job, then watch to see how close your listener comes to doing it as you expected.

Negotiating A Conflict of Needs

1. Rules

Now you bring out all the tools in your kit. There are some rules for using them.

- You can not negotiate an issue on which you have already made up your mind. **Give and take is essential.**
- Don't try to solve a complex problem if you have only a short time.

2. The Six Steps in the Conflict Negotiation Process

STEP 1: Defining the Problem in Terms of Needs (It should not be an "if I win you lose" situation)

This is a critical step in problem solving. First, **your statement of the problem should be stated in a way that does not communicate blame or judgement.** Sending "I" messages is the most effective way for stating a problem.

Secondly, after you have stated your feelings, **try to verbalize the other person's side of the conflict.** If you don't know his side, ask him to state it for himself.

Frequently, it will take awhile to get the problem or conflict defined accurately. The other person may need to take some time to get his own feelings off his chest. He may initially get angry or defensive. This is the time to use reflective listening. He must have a chance to get his feelings out or else he will not be ready for the remaining steps in the problem solving process.

Don't be in a hurry to get to Step II. Be sure you understand the other's point of view, and be sure you state yours accurately.

Don't undershoot your own feelings. If you do, the other person may not feel very motivated to enter into problem solving.

Frequently, a problem will get redefined as it is discussed – the initial statement of the problem will turn out to be a superficial one. Or, the other person's statement of his feelings may cause you to see the problem in a new light.

Before moving to Step II, be sure both of you accept the definition of the problem. Test this out – ask if he accepts that this is the problem you both are going to try to solve. Are both sets of needs accurately stated?

Lastly, make certain he understands clearly that you both are looking for a solution that will meet both sets of needs, that will be acceptable to both – **nobody is to lose.**

STEP II: Generating Possible Solutions (No evaluation allowed in this step)

This is the creative part of problem solving. It is frequently hard to come up with a good solution right away. Initial solutions are seldom adequate, but they may stimulate someone coming up with better ones. As the other person first if he has any possible solutions – you'll have plenty of time to offer yours.

At all costs, **avoid being evaluative and critical of his solutions.** Use reflective listening. Treat his ideas with respect.

Try to get a number of possible solutions before evaluating or discussing any particular one. Discourage evaluation until a number of possible solutions are generated. Remember you are trying to arrive at the best solution, not just any solution.

If things bog down, state the problem again. Sometimes this will start the wheels turning. Generally it will become apparent when to move into Step III – when you have generated a number of reasonably feasible solutions, or when one person's appears to be far superior to the others.

STEP III: Evaluating and Testing the Various Solutions

This is the stage of the problem solving where you must be honest; and, of course, you want the other person to be honest too. Both of you will want to do a lot of critical thinking. Are there flaws in any of the possible solutions? Any reason why a solution might not work? Will it be too hard to implement or carry out? Is it fair to both? Use reflective listening.

Sometimes in evaluating the solutions already generated, a brand new one will be thought of, better than any of the others. Or an earlier one will be improved upon by some suggested modification.

Failure to test solutions at this stage of the process will increase the chance of ending up with a poor solution, or one that will not be carried out earnestly.

STEP IV: Deciding on a Mutually Acceptable Solution

A mutual commitment to one solution must be made. Usually when all the facts get exposed, one clearly superior solution stands out.

Don't make the mistake of trying to persuade or push a solution on the other. If he doesn't freely choose a solution acceptable to him, chances are he will not carry it out.

When it appears that perhaps you are close to a decision, state the solution to make certain you both understand what you are about to decide.

Frequently, writing down the solution will be necessary in order that later misunderstandings can be checked against the decision you both agreed upon.

STEP V: Implementing the Solutions

It is, of course, one thing to arrive at a creative solution, and another to carry it out. Immediately after a solution has been agreed upon, it is generally necessary to talk about implementation.

Who does What by When?

The most constructive attitude to have is one of complete trust that the other person will faithfully carry out his part of the decision, rather than raise the question of what is to be done if he doesn't. Consequently, it is not wise to talk about penalties for failure to implement a solution at this time.

However, if later on the other person fails to carry out his end of the agreement, confront him with "I" messages. You also may be able to offer suggestions to help him remember to do his job.

STEP VI: Evaluating the Solution

Not all solutions from this method turn out to be the best. Sometimes you or the other person will discover weaknesses in the solution, in which case the problem should be returned for more problem solving.

Sometimes it is important to go to the other and ask how he feels about the solution.

Both of you should have an understanding that decisions are always open for revision, but that neither of you unilaterally can modify a decision. Modifications have to be mutually agreed upon, just as was the initial decision.

> Example: A mother and daughter were squabbling about the use of their home's one bathroom in the mornings. On using these six steps, they learned that the problem was not, as you might suspect, having only one bathroom. The problem was that neither had good lighting in their bedrooms. The solution agreed upon was a lighted make-up mirror for the daughter. The cost – approximately $20.00! The results – peaceful mornings.

To Recap

To produce a healthy, functioning relationship and people with high levels of self esteem, you need to cultivate a win – win perspective in a climate of mutual respect. Some of the tools you use are words to express your feelings, thoughts, beliefs; reflective listening; behaviour description; and time.

This quotation by Hugh Prather in Notes to Myself sums it up:

If I ignore the emotional plea and respond only to the words, I will not be communicating with you, there will not be a flow of understanding between us, I will not be feeling you and so I will be frustrated and you will be also. The heart of any conversation is the demand being made on my emotions. If I feel frustrated, that is a good sign I am avoiding the emotions you are trying to communicate – I have not paused long enough to ask, "What do you really want from me?"

Further Reading

The following are books about communication between couples:

1. Alive and Aware by Sherod Miller, Ph.D., Elam W. Nunnally, PH.D., and Daniel B. Wackman, PH.D., Interpersonal Communication Programs, Inc. Minneapolis 1975.
2. The Intimate Enemy: How to Fight Fair in Love and Marriage by Dr. George R. Bach and Peter Wyden, Avon paperback 1968.

These books deal with families:

1. Peoplemaking by Virginia Satir, Science and Behaviour Books, Inc. Palo Alot, California 1972.
2. Self-Esteem: A Family Affair by Jean Illsley Clarke, Winston Press Inc. Minneapolis 1978.
3. Parent Effectiveness Training by Dr. Thomas Gordon, Peter H. Wyden, Inc. New York 1970.

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4. READING SKILLS

The ability to read is an essential and integrated learning in all I.O.P. courses.

Students in occupational courses should be able to:

- read simple instructions
- follow instructions
- locate resource centres
- recognize the variety of resources related to a specific occupation.

TEACHERS OF STUDENTS IN OCCUPATIONAL COURSES SHOULD INTEGRATE THEIR INSTRUCTIONAL PLANNING WITH TEACHERS OF ENGLISH, TEACHER LIBRARIANS AND COMMUNITY LIBRARIANS.

Through integrated planning, teachers of occupational courses may:

- provide teachers of English with vocabulary lists, types of instructions used in course, trade magazines, and so on
- require students to engage in task-related readings
- encourage student use of libraries and other resource centres in class, school, community
- encourage librarians to obtain related resources
- have a visible and accessible in-class resource centre that includes trade magazines, reference journals, work manuals and related print materials.

The concepts, skills and attitudes related to reading developed in this unit include:

1. Identifies resource centres.
2. Recognizes the variety of resources.
3. Follows written instructions.
4. Locates references.

RESOURCES

STUDENT RESOURCE

- *Working: Today and Tomorrow*, Canadian Edition. Toronto, Ontario: Irwin Publishing, 1990.

Correlation of Learning Objectives with Student Resource

Concepts, Skills and Attitudes	*Working: Today and Tomorrow*
4. Reading Skills	Chapter 4 Oral reading of other appropriate sections should be encouraged.

TEACHER RESOURCES

- Resource 20, "Literature Summary Sheet"
- Resource 21, "New Terms and Words"
- Government pamphlets/booklets
- Teachers (e.g., English, librarians, social studies)
- Community partners.

1. RESOURCE CENTRES
2. RESOURCES

Students enrolled in each occupational course should be encouraged to access, read and/or view literature including:

- trade/business journals
- service/shop manuals
- catalogues
- video/audiotapes
- government pamphlets/booklets.

Each occupational lab should have a visible and accessible area where related literature is displayed. Students should be encouraged, as frequently as possible, to search for information in the resource area rather than be "given" answers to their questions.

In situations where an in-class resource centre is limited or not feasible:

- ensure that the school library has appropriate resources available (e.g., journals, catalogues, pamphlets)
- encourage students to become members of and use the community library services
- help students locate and gain access to other resource centres (e.g., government departments, labour union libraries).

Suggested Activities/Community Partnerships

1. a. Using the periodical indexes and other resources in the school or community library, identify and list literature (e.g., journals, books, videos) that relates to the course.

   b. Which item of literature provides the most up-to-date information about related jobs/careers?

2. Select an article or chapter that interests you in a business, industry or trade journal, and:
   - read the article or chapter (oral reading in class should be encouraged)
   - summarize the two or three major points in the article or chapter and present them to the class
   - answer questions on the topic you presented.

   (Use Resource 1, "Literature Summary Sheet" to record the name of the book or journal, the name of the article, and your summary of the two or three major points in the article.)

3. Invite community partners to share "in-house" produced literature (e.g., newsletters, product information articles, labour union information pamphlets).

3. FOLLOWING WRITTEN INSTRUCTIONS
4. LOCATING REFERENCES

Every occupation needs employees who are willing and able to follow both verbal and non-verbal instructions. Written instructions often provide a lasting reference to:

- what is to be done
- how it is to be done
- how the completed task will be evaluated.

Written instructions rather than verbal instructions may be used to ensure that:

- any number of employees get the same information
- the procedures for carrying out a task are followed exactly as written and described
- there is a lasting record of the instructions.

Written instructions will be remembered more easily if they are part of a mnemonic device (see Suggested Teaching Strategies, "First Letter Mnemonic"). For example, a mnemonic to reinforce safety awareness might be:

CARE **C**are
Alertness
Responsibility
Everyday.

The student workbooks developed for each occupational course and the school handbook (if available) may be used to reinforce the importance of following written instructions; e.g.,

- following procedures outlined on the job sheets
- reading and reacting to the various student activities
- following school policies related to:
  - absences from school or from a community partnership placement
  - late arrivals
  - emergency situations
  - grant and loan applications
  - relating to peers, teachers and others.

Suggested Activities/Community Partnerships

1. Discuss:
   - Must instructions always be followed? Why or why not?
   - Are written instructions more apt to be followed than verbal instructions? Why or why not?
   - In what form are instructions most often given in occupations? Why?

2. a. Using the school or community library, borrow a copy of two books or journals that relate to topics discussed in the course.

   b. Share the literature with classmates.

3. Many businesses, industries and trades have their own journals or magazines. Examine one or more of these publications and discuss the following questions:
   - Why do some businesses, industries and trades have their own publications?
   - What items in a journal do you find most interesting? Why?
   - Businesses, industries and trades are often used to advertise new technology. How may these advertisements help you?

4. New terms or words are regularly being used in business and industry. Each time you hear or read a term or word that is new to you, write it down – and using a dictionary, trade or business journal, or by asking your teacher, supervisor or community partner – define or describe the term or word. (Resource 21, "New Terms and Words" may be used to maintain a record of terms and words.)

LITERATURE SUMMARY SHEET

Read a journal article or chapter in a book related to the course and:

- record the name of the journal/title of the book
- title of the article/chapter title
- summarize the major points from what you read.

JOURNAL NAME/TITLE OF ARTICLE	SUMMARY OF MAJOR POINTS
BOOK TITLE/TITLE OF CHAPTER	
OTHER LITERATURE	

NEW TERMS AND WORDS

Course: ______________________ Name: ______________________

Each time you hear or see a term or word that is new to you, write it in the column on the left and – using a dictionary, a trade or business journal, or by asking your teacher, supervisor or a community partner – define or describe the term or word.

NEW TERM/WORD	DEFINITION/DESCRIPTION
e.g., technology	e.g., putting theory into practice

5. WRITING SKILLS

The ability to demonstrate basic writing skills is an essential and integrated component in all I.O.P. courses. Writing is a transferable skill across occupational clusters and courses.

The student workbook developed for each occupational course includes opportunities for students to practise their writing skills. In addition, the suggested writing activities in this unit may be used, complemented and supplemented with other teacher generated activities to enhance students' writing ability.

The concepts, skills and attitudes related to writing developed in this manual include:

1. Writes complete sentences.
2. Recognizes need for basic writing skills.
3. Completes simple forms.

TEACHERS OF I.O.P. COURSES ARE ENCOURAGED TO CONSULT WITH ENGLISH 16 AND SOCIAL STUDIES 16 TEACHERS TO OBTAIN ADDITIONAL SAMPLES OF WRITING ACTIVITIES (E.G., RÉSUMÉS, LETTERS OF INQUIRY, JOB APPLICATION FORMS) AND TO PROVIDE INTEGRATED INSTRUCTION OF THIS IMPORTANT SKILL.

RESOURCES

STUDENT RESOURCE

- *Working: Today and Tomorrow*, Canadian Edition. Toronto, Ontario: Irwin Publishing, 1990.

Correlation of Learning Objectives with Student Resource

Concepts, Skills and Attitudes	*Working: Today and Tomorrow*
5. Writing Skills	Chapter 7 "Applying for Jobs"

TEACHER RESOURCES

- Resource 22, "Application for Social Insurance Number"
- Resource 23, "Application for Employment"
- Student workbooks
- Community partners

1. BASIC WRITING SKILLS
2. WRITING SIMPLE SENTENCES

The ability to write legibly and in complete sentences and paragraphs enhances each student's chances to find, obtain and retain employment. However, the amount and type of writing required on the job may vary among occupations.

Suggested Activities/Community Partnerships

1. Write a set of instructions that might help another person:
    a. to get from your home to your school
    b. to search for a part-time job (include all parts of the process).
2. Written instructions are sometimes presented in the form of a flow chart.
    a. Select one of the sets of instructions developed in the previous question and present it in the form of a flow chart.
    b. In what other ways could similar instructions be presented? Which way is best? Why?
3. a. Write a paragraph describing why the ability to write is important/not important on a particular job (see Suggested Teaching Strategies, "Descriptive Writing").
    b. Discuss: "Is basic writing ability an essential requirement to:
        - get a job?
        - retain the job?"
4. Use whole sentences to complete the student activities requiring written answers in your student workbook.

3. COMPLETING SAMPLE FORMS

The ability to complete various forms legibly, and to answer each written question, enhances each student's ability to:

- obtain necessary documents (e.g., driver's licence, social insurance card)
- obtain and complete job application forms
- respond to questionnaires and surveys
- complete a variety of student activities in occupational and other courses
- participate in a variety of community activities.

Sample copies of the following forms are provided:

- Resource 22, "Application for Social Insurance Number"
- Resource 23, "Application for Employment".

Suggested Activities/Community Partnerships

1. a. Many employers and community agencies may ask you to fill in an application form. Visit two local employers and two community agencies and obtain a copy of their job application forms, e.g.:
    - Application for Employment
    - Social Insurance Number
    - Driver's Licence
    - Library privileges at the community library.

   b. If you have not previously completed any of these forms,
    - make a copy of each form
    - practise completing each form.

2. Application for employment forms may have a section that allows the applicant to list special skills or to offer additional information.

   a. What would you list in the "Special Skills" section? (See Resource 23, "Application for Employment".)

   b. What would you write in the "Additional Comments" section?

   c. Why would an employer want this information?

   d. Discuss: "What impression is created if these sections are not complete?"

Employment and Immigration Canada Emploi et Immigration Canada

DESTROY. WHEN PURPOSE SERVED

APPLICATION FOR A SOCIAL INSURANCE NUMBER OR REPLACEMENT OF SOCIAL INSURANCE NUMBER CARD
NOT TO BE USED TO AMEND SOCIAL INSURANCE RECORDS
(USE FORM EMP 2121)

PRINT IN DARK INK OR USE TYPEWRITER.
LEAD PENCIL NOT ACCEPTED.

DO NOT WRITE IN THESE SPACES

18

1 NAME TO BE SHOWN ON CARD	FIRST NAME	MIDDLE NAME	PRESENT FAMILY NAME (SURNAME)
2 DATE OF BIRTH DAY MONTH YEAR	DO NOT WRITE HERE	3 SEX M ☐ F ☐ TWIN ☐	4 MOTHER'S MAIDEN NAME
5 FATHER'S FULL NAME		6 APPLICANT'S PLACE OF BIRTH (CITY, TOWN, VILLAGE, PROVINCE, COUNTRY)	
7 FAMILY NAME AT BIRTH	8 OTHER FAMILY NAME(S) FORMERLY USED		DO NOT WRITE HERE
9 HAVE YOU EVER BEFORE APPLIED FOR OR RECEIVED A SOCIAL INSURANCE NUMBER	YES ☐ NO ☐	10 IF "YES" WRITE YOUR NUMBER HERE AND INCLUDE CURRENT FEE	DON'T KNOW ☐
11 MARITAL STATUS SINGLE ☐ MARRIED ☐ OTHER ☐	12 STATUS IN CANADA CANADIAN CITIZEN ☐ STATUS INDIAN ☐ PERMANENT RESIDENT ☐ OTHER ☐		13 AREA CODE TELEPHONE NO
14 YOUR MAILING ADDRESS (NO AND STREET)	(CITY, TOWN, VILLAGE)	(PROVINCE)	(POSTAL CODE)
15 APPLICANT'S SIGNATURE	DATE	16 IF MARK X IS USED AS SIGNATURE IN BOX 15 HAVE 2 WITNESSES SIGN HERE FIRST WITNESS SECOND WITNESS	
17 ALL NAMES AS SHOWN ON PRIMARY DOCUMENT (FOR LOCAL OFFICE USE ONLY)	SURNAME		DOCUMENTS PRIMARY SEC./SUPP.
DO NOT WRITE IN THESE SPACES (FOR CENTRAL INDEX USE ONLY)			FEE PAID IF REPLACEMENT CARD Amount Clerk's Initials

SPECIMEN

INFORMATION COLLECTED ON THIS FORM IS USED FOR THE PURPOSE OF ISSUING SOCIAL INSURANCE NUMBERS. ITS COLLECTION IS AUTHORIZED BY THE UNEMPLOYMENT INSURANCE ACT. FOR MORE DETAILS ON THE USES AND RIGHTS CONCERNING INSPECTION AND CORRECTION OF THE INFORMATION, REFER TO THE PERSONAL INFORMATION INDEX, BANK NO. EIC/P-PU-390, AVAILABLE AT POST OFFICES.

NOTE: IT IS A CRIMINAL OFFENCE TO KNOWINGLY APPLY FOR MORE THAN ONE SOCIAL INSURANCE NO. YOU ARE NOT PERMITTED TO GIVE OR LEND YOUR CARD TO ANYONE.

IMPORTANT ▶ **YOUR SOCIAL INSURANCE CARD WILL BE MAILED TO YOU AT THE ADDRESS THAT YOU PRINT BELOW**

NAME	
ADDRESS	
CITY PROVINCE	
POSTAL CODE	

TAKE CARE OF YOUR CARD. IT IS VALUABLE. COPY YOUR NUMBER HERE AND KEEP FOR YOUR RECORDS

YOUR SOCIAL INSURANCE NUMBER IS

THIS NUMBER IS ISSUED IN YOUR NAME ONLY

EMP 2120 (7-86)

Canada

(FRANÇAIS AU VERSO)

IMPORTANT

Your application will be rejected if not accompanied by a **PRIMARY** document and a **SECONDARY** or **SUPPORTING** document. Refer to the brochure "HOW TO APPLY FOR A SOCIAL INSURANCE NUMBER (SIN)", for these documents.

FINAL CHECK

Have you completed the application in full?
Have you signed the application with a written (not typed) signature?

Do you have the two required documents:

- **PRIMARY DOCUMENT** (original or true certified copy) and
- **SECONDARY DOCUMENT** (a photocopy is acceptable), or
- **SUPPORTING DOCUMENT**, if required (an original or true certified copy).

(Please refer to the brochure *HOW TO APPLY FOR A SOCIAL INSURANCE NUMBER (SIN)*, for these documents.)

FEE: Submit the current fee for a replacement card only, in one of the following forms payable to the RECEIVER GENERAL FOR CANADA:

- Money order (postal, bank, C.N., C.P.)
- Personal cheque
- Bank draft
- Cash, if presented personally;

DO NOT MAIL CASH.

We encourage you to take your application and documents to the nearest Canada Employment Centre. Your application will be certified and your documents will be returned to you immediately. If this is inconvenient, you may mail your application and documents to:

Social Insurance Registration
Central Index
P.O. Box 7000
Bathurst, N.B.
E2A 4T1

Since we are not responsible for documents sent through the mail, we suggest that you mail your application and documents by *Registered Mail*. If you want your documents returned by *Registered Mail*, put the necessary postage on your return envelope. Otherwise, your documents will be returned to you by First Class Mail.

IMPORTANT

Votre demande sera rejetée si elle n'est pas accompagnée d'un document **PRINCIPAL** et d'un document **SECONDAIRE** ou d'une **PIÈCE JUSTIFICATIVE**. Veuillez consulter la brochure "COMMENT DEMANDER UN NUMÉRO D'ASSURANCE SOCIALE (NAS)", pour obtenir une liste de ces documents.

DERNIÈRE VÉRIFICATION

Avez-vous rempli la demande au complet?
Avez-vous signé la demande à la main (les signatures dactylographiées ne sont pas acceptées)?
Avez-vous les deux documents exigés:

- **DOCUMENT PRINCIPAL** (original ou copie conforme) et
- **DOCUMENT SECONDAIRE** (une photocopie est acceptée) ou
- **PIÈCE JUSTIFICATIVE**, au besoin (l'original ou une copie conforme).

(Veuillez consulter la brochure *COMMENT DEMANDER UN NUMÉRO D'ASSURANCE SOCIALE (NAS)*, pour obtenir une liste de ces documents).

FRAIS: Versez les frais courants payables au RECEVEUR GÉNÉRAL DU CANADA s'il s'agit d'une carte de remplacement. Payez de l'une des façons suivantes:

- mandat (postal, bancaire, C.N., C.P.)
- chèque personnel
- traite bancaire
- comptant, si la somme est versée en personne.

NE PAS ENVOYER D'ARGENT PAR LA POSTE.

Nous vous invitons à vous rendre au Centre d'emploi du Canada le plus près de chez vous pour présenter votre demande et remettre les documents exigés. La demande sera authentifiée et vos documents vous seront remis immédiatement. Si cette démarche vous cause des problèmes, vous pouvez poster votre demande et les documents pertinents à l'adresse suivante;

Immatriculation aux assurances sociales
Fichier central
C.P. 7000
Bathurst (N.-B.)
E2A 4T1

Comme nous ne sommes pas responsables des documents qui sont envoyés par la poste, nous vous suggérons d'expédier votre demande et les documents pertinents par *Courrier recommandé*. Si vous désirez que les documents vous soient retournés par *Courrier recommandé*, veuillez affranchir comme il se doit l'enveloppe de retour. Autrement, les documents vous seront retournés par courrier de première classe.

For permission to reprint copyrighted material, acknowledgement is made to Employment and Immigration Canada for permission to reprint the Social Insurance Number Application Form.

APPLICATION FOR EMPLOYMENT

Name ____
Last First Middle Social Insurance Number Date

Address ____________________ Home Telephone Number ____________________

City ________ State ________ Postal Code ________ Period of Residence ____________________

Previous Address ____
Street City State Postal Code Period of Residence

Position Applying For ____________ When Available ____________ Salary Expected ____________

Have you previously applied for work with us? ( ) Yes ( ) No If yes, when ____________

Referred By (Name) ____

Is there anything that would prevent you from performing the duties of the position for which you are applying? ( ) Yes ( ) No
If yes, explain ____

Are you currently under the care of a doctor? ( ) Yes ( ) No If yes, describe in full ____________

Have you ever been convicted of a crime? ( ) Yes ( ) No If yes, describe in full ____________

Do you have a Driver's Licence? ( ) Yes ( ) No If yes, give number and province issued ____________

Person to notify in case of emergency ____________ Relationship ____________ Phone ____________

EDUCATIONAL DATA

SCHOOL	NAME	CITY & STATE	MONTH & YEAR		DEGREE OR GRADE LEVEL COMPLETED	AREA OF SPECIALTY
			FROM	TO		
Grade						
High						
College University						
Graduate School						
Trade, Business or Other						
Special Skills (List)					Typing Speed WPM	Shorthand Speed WPM

RECORD OF PREVIOUS EMPLOYMENT

(Detailed explanation may be attached to indicate any special employment experience)

PAST EMPLOYERS Company Name, Address, Phone Number	Department(s) Worked	Supervisor(s) Name	Position(s) Held	Employed		Rate of Pay	Reason for Leaving
				From	To		

You may contact all of the above listed employers except ______________________________

For Applicant's additional comments or information not covered by the Form, such as: career, interests, plans, objectives, etc. ____________

This Application will be retained in our active files for one (1) year only. If you wish to submit another application after this period of time, please feel free to do so.

I agree to abide by all the rules of the Company and will obey the orders and instructions of my supervisor. I will use and wear all safety appliances furnished me by the Company and will be careful in my work and not expose myself or other workers to unnecessary dangers.

In the event of my employment, I understand that a physical examination may be required to be passed.

It is understood that false statements on this application may result in my dismissal.

Signature of Applicant ____________________ Date ____________________

This is a typical job application form, however, no two forms are exactly alike. Read and follow all directions carefully each time you apply for a job.

6. MATHEMATICAL SKILLS

Each I.O.P. course is designed to assist students to develop the ability to use basic mathematical concepts and skills and to develop an appreciation of the importance of computational competence and problem-solving skills as both life and work skills.

TEACHERS OF OCCUPATIONAL COURSES SHOULD ATTEMPT TO:

- **INTEGRATE LESSON PLANNING WITH TEACHERS OF I.O.P. MATHEMATICS (SEE SUGGESTED TEACHING STRATEGIES, "AVID")**
- **INTEGRATE APPROPRIATE LEVEL MATHEMATICS INTO NORMAL USE OF EQUIPMENT, TOOLS AND SUPPLIES**
- **INCLUDE BASIC MATHEMATICAL SKILLS AS A COMPONENT OF STUDENT EVALUATION**
- **USE METRIC AND NON-METRIC MEASURES (E.G., IMPERIAL AND U.S.) WHERE APPROPRIATE**
- **ENCOURAGE STUDENTS TO USE CALCULATORS AND MEASURING TOOLS CORRECTLY AS BOTH A LIFE AND A WORK SKILL.**

Mathematical skills may be integrated with occupational courses in a variety of ways including:

- checking inventories
- checking change received
- estimating supply requirements and costs of a project or service
- measuring (e.g., area, length, mass, temperature, volume)
- making change
- understanding paychecks
- writing bills and work orders.

The concepts, skills and attitudes related to mathematics in this unit include:

1. Reads numbers to six digits.
2. Adds, subtracts, multiplies and divides.
3. Uses whole numbers, fractions and decimals.
4. Uses metric units of measurement.
5. Uses non-metric units of measurement, where necessary.

RESOURCES

STUDENT RESOURCE

- *Working: Today and Tomorrow*, Canadian Edition. Toronto, Ontario: Irwin Publishing, 1990.

Concepts, Skills and Attitudes	*Working: Today and Tomorrow*
6. Mathematical Skills	Chapter 1 "The Value of Transferable Skills"

TEACHER RESOURCES

- Resource 24, "Sample Work Order"
- Resource 25, "Metric Practice Guide for Teachers"
- Resource 26, "Measuring Tools and Units of Measurement Chart"
- Resource 27, "Materials Unit of Sale Chart"
- Community partnerships.

1. READS NUMBERS
2. ADDITION, SUBTRACTION, MULTIPLICATION AND DIVISION
3. WHOLE NUMBERS, FRACTIONS AND DECIMALS

Each student workbook contains activities and job sheets that require students to use and further develop mathematical skills. Teachers are encouraged to supplement and complement these activities with other activities that integrate new and reinforce previously learned mathematical concepts, skills and attitudes.

Basic numeric calculations using whole numbers, fractions and decimals are process activities. Some I.O.P. students tend to experience difficulty comprehending process skills; it is important that they be given the opportunity to learn to perform numeric calculations in concrete contexts.

Suggested Activities/Community Partnerships

1. Invite guest speakers from related occupations to discuss:
   - the use of numeric calculations skills in the workplace
   - if the ability to perform basic calculations is an important entry-level skill. If so, why?
   - the kinds of calculating tools used in workplaces (e.g., calculator, cash register).
2. Invite a guest speaker from a local bank, credit union or loan company to discuss the services offered to:
   - individual account customers
   - business accounts
   - people wanting to start their own business.
3. Where appropriate, use a copy of Resource 24, "Sample Work Order" to record details of customer service work and to calculate costs.

4. METRIC UNITS OF MEASUREMENT
5. NON-METRIC UNITS OF MEASUREMENT

Metric and Non-Metric Measurement

Alberta Education's Metrication Policy includes the following:

1.1 **SI units become the principal system of measurement in the curriculum of the schools in the province.**

1.1 It has become imperative that the school curriculum prepare students to cope with metric measures in all facets of their life. In addition, many students will require a detailed knowledge of more specialized units used in specific career fields.

1.3 Resource materials for the classroom should use SI units as the principal measuring system with only such references to the imperial or "old" metric systems as are unavoidable.

2.3 It is entirely possible that some of the high school technical and vocational programs will have a need to continue teaching the use of imperial units. It may take a specific technological area some considerable time to make the change, especially one that uses machinery with a long working life.

4.3 Since measurement is an activity related process, it follows that individuals — teachers as well as students — learn the metric units while measuring or in using the units that one is learning.

In accordance with the provincial metrication policy, teachers should:

- **use SI units of measurement whenever possible in activities**
- **use imperial or other non-metric units only where the use of such measurement parallels its common usage in occupations.**

Relevant information from Resource 25, "Metric Practice Guide for Teachers", may be provided to students to facilitate their use of SI metric units of measurement.

Suggested Activities/Community Partnerships

1. Investigate the use of units of measurement in the workplace by:
   - visiting a work site and observing the use of measurement tools and units. Use Resource 26, "Measuring Tools and Units of Measurement Chart", to record your observations.
   - inviting community partners to discuss with the class the use of SI metric and non-metric tools and units in occupations.

2. Discuss: "Why do some businesses (e.g., supermarkets) use both metric and imperial units in their display of unit prices (e.g., $.90/lb, $1.98/kg)?"

3. Visit a local company that supplies materials to the school/workplace and identify and record two or more items that are usually sold by:
   - area
   - length
   - volume
   - mass.

   Use Resource 27, "Materials Unit of Sale Chart", to record your observations.

SAMPLE WORK ORDER

I HEREBY AUTHORIZE ALL WORK AS DESCRIBED AND ALL NECESSARY PARTS ________________	CUSTOMER		PHONE	**OFFICE USE ONLY**
	ADDRESS		CALL WHEN READY AM PM	
PARTS/SUPPLIES	MAKE	MODEL		
	TIME RECEIVED	TIME PROMISED	WRITTEN BY	
	SERIAL NO		DATE	
	JOB DESCRIPTION			**LABOUR**
	ALL ALTA SERVICE 1986 – 88 Street Somewhere, Alberta T4A 5W8 Telephone: 000-0000		**TOTAL LABOUR**	
			TOTAL PARTS/SUPPLIES	
			OTHER (Specify)	
TOTAL			**TOTAL AMOUNT**	

Mathematical Skills: Resource 25

METRIC

PRACTICE GUIDE

for

TEACHERS

BASED ON ACCEPTED CANADIAN

This document is published solely as information providing current metric practices as accepted by the Standards Council of Canada.

PREPARED FOR DISTRIBUTION TO
ALBERTA SCHOOLS IN CO-OPERATION WITH
ALBERTA GOVERNMENT SERVICE, METRIC BRANCH
AND
ALBERTA EDUCATION

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1982 11 15

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USING UNITS

1. Unit names are spelled out in lower-case letters.
   e.g., litre newton kilogram

   Exception – degree Celsius

2. Only one prefix is used with a unit at one time.
   e.g., centilitre decimetre

3. If a compound unit involving division is spelled out, the word "per" is used.
   e.g., metres per second revolutions per minute

4. If a compound unit involving multiplication is spelled out, no hyphen is used.
   e.g., kilowatt hour

5. The choice of the appropriate decimal multiple or sub-multiple of a unit is governed by convenience. However, the use of prefixes representing 10 raised to a power that is a multiple of 3 is recommended.
   e.g., 0.6 km ($m \times 10^3$) rather than 6 hm ($m \times 10^2$)

USING SYMBOLS

1. The symbols are always printed in upright type.
   e.g., m g °C L

2. Symbols are written in lower-case letters, except when the unit name is derived from a proper name.
   e.g., m s N Pa

   Exception – L (litre) the symbol ℓ is not acceptable.

3. When the names of units which derive from a proper name are written out in full, only Celsius is capitalized.
   e.g., newton pascal

4. Symbols should be used with numerals.
   e.g., 7 cm seven centimetres

5. Symbols are never pluralized.

6. A symbol is not followed by a period (except at the end of a sentence).

7. Symbols for prefixes are shown in lower-case except for those that are greater than "kilo".
   e.g., kW (kilowatt) MW (megawatt)

8. Exponents are used with symbols for units that are squared or cubed.
   e.g., m^2 cm^3

9. Symbols should not be used to start a sentence.

10. Compound symbols formed by dividing units contain a solidus (/) to indicate the division.
    e.g., km/h (kilometres per hour) r/min (revolutions per minute)

11. The solidus, as a symbol of division, must not be repeated in the same expression unless ambiguity is removed by the use of brackets.
    e.g., (m/s)/s is acceptable
    m/s^2 is preferable

12. Division by a unit may be shown by means of a negative exponent. In such cases, the dot must also be used to avoid misunderstanding.
    e.g., $m \bullet s^{-1}$ (metre per second)

13. When a unit is formed by division, the prefix, if any, should be attached to a unit in the numerator.
    e.g., km/s not m/ms

    Exception – When the base unit "kilogram" appears in a denominator.
    e.g., MJ/kg is preferred to kJ/g.

14. Compound symbols formed by multiplying units contain a dot to indicate multiplication.
    e.g., kW•h (kilowatt hour) N•m (newton metre)

USING NUMERALS

1. A space is left between the last digit of a numeral and the first letter of the symbol.
   e.g., 45 g 60 MW

   Exception – When the first character of a symbol is not a letter, no space is left.

   e.g., 15°C 30° 20′40″ (30.344° is the method used with computers and in compilation)

2. A decimal fraction is indicated by means of a decimal marker on the line and, at present in Canada, the marker is generally a point positioned in line with the base of the associated numeral.

3. Spaces, not commas, are left between groups of 3 digits to the left and right of the decimal marker.

   Note: The space is optional if there are only 4 digits to the left or right of the decimal, unless such numerals are listed in a column with other numerals of 5 digits or more.
   e.g., 12 345,678 901 2
   1245 (1 245 optional)
   5.1234 (5.123 4 optional) but 5.123 45

   Exception – These guidelines do not apply to monetary units used on negotiable instruments. To help avoid fraud (filling in the space with a numeral), negotiable instruments will continue to use a comma. Students should recognize both forms of writing numerals.

4. Decimal fractions are generally preferred to common fractions.

5. A zero is placed to the left of the decimal marker to indicate that there is no other digit to the left.
   e.g., 0.25

6. In general, only one unit should be used to express a measured quantity.
   e.g., 1.15 m is preferred to 1 m 15 cm

7. In general, in the expression of any quantity, a prefix should be chosen so that the numerical value lies between 0.1 and 1000. However, when similar quantities are compared, it is better to use the same prefix for all items even though some values may fall outside the 0.1 to 1000 range.

8. A dot must not be used as a multiplier between numerals.
   e.g., 5×7 not 5•7

9. In the expression of numbers over ten, digits are preferred to fully spelled out words.
   e.g., 28 m

TABLE OF SI PREFIXES*

Multiplying Factor	Prefix	Symbol
1 000 000 000 000 000 000 = 10^{18}	exa	E
1 000 000 000 000 000 = 10^{15}	peta	P
1 000 000 000 000 = 10^{12}	tera	T
1 000 000 000 = 10^{9}	giga	G
1 000 000 = 10^{6}	mega	M
1 000 = 10^{3}	kilo	k
100 = 10^{2}	hecto	h
10 = 10^{1}	deca	da
0.1 = 10^{-1}	deci	d
0.01 = 10^{-2}	centi	c
0.001 = 10^{-3}	milli	m
0.000 001 = 10^{-6}	micro	µ
0.000 000 001 = 10^{-9}	nano	n
0.000 000 000 001 = 10^{-12}	pico	p
0.000 000 000 000 001 = 10^{-15}	femto	f
0.000 000 000 000 000 001 = 10^{-18}	atto	a

*Canadian Metric Practice Guide
National Standard of Canada
CAN 3-Z234.1-79
Canadian Standards Association

UNITS, PREFIXES AND SYMBOLS

Name of Unit or Prefix	Symbol	Quantity	Practical Equivalent
ampere	A	electric current	base unit
ampere per metre	A/m	magnetic field strength	
candela	cd	luminous intensity	base unit
candela per square metre	cd/m^2	luminance	
centi	c	prefix	$10^{-2} = 0.01$
centilitre	cL	capacity	0.01 L
centimetre	cm	length	0.01 m
coulomb	C	electric charts	A•s
cubic centimetre	cm^3	volume	1 cm^3 (volume) = 1 mL (capacity)
cubic metre	m^3	volume	1 m^3 (volume) = 1 kL (capacity)
cubic metre per mole	m^3/mol	molar volume	
cubic metre per second	m^3/s	volume flow rate	
day	d	time	24 h
deca	da	prefix	$10^1 = 10$
decalitre	daL	capacity	10 L
decametre	dam	length	10 m
deci	d	prefix	$10^{-1} = 0.1$
decilitre	dL	capacity	0.1 L
degree Celsius	°C	temperature	
degree (of arc)	°	angle	$180° = \pi rad$
farad	F	electric capacitance	C/V
giga	G	prefix	10^9
gram	g	mass	0.001 kg
gram per cubic centimetre	g/cm^3	density	1 gm/cm^3 = 1 000 kg/m^3
gram per millilitre	g/mL	density	1 gm/mL = 1 g/cm^3
hectare	ha	area	10 000 m^2
hecto	h	prefix	$10^2 = 100$

Name of Unit or Prefix	**Symbol**	**Quantity**	**Practical Equivalent**
hectometre	hm	length	100 m
henry	H	inductance	Wb/A
hertz	Hz	frequency	$s^{-1} = \frac{1}{s}$
hour	h	time	60 min
joule	J	energy	
joule per kilogram	J/kg	specific energy	
joule per kilogram kelvin	J/(kg•K)	specific heat capacity	
kelvin	K	temperature	base unit
kilo	k	prefix	$10^3 = 1\,000$
kilogram	kg	mass	base unit
kilogram metre per second	kg•m/s	momentum	
kilogram per cubic metre	kg/m^3	density	g/L
kilohertz	kHz	frequency	1 000 Hz
kilolitre	kL	capacity	1 000 L
kilometre	km	length	1 000 m
kilometre per hour	km/h	speed	
kilonewton	kN	force	1 000 N
kilopascal	kPa	pressure	1 000 Pa
kilowatt	kW	power	1 000 W
litre	L	capacity	1 L (capacity = 1 cm^3 (volume)
lumen	lm	luminous flux	cd•sr
lumen second	lm•s	quantity of light	
lux	lx	illuminance	lm/m^2
lux second	lx•s	light exposure	
mega	M	prefix	$10^6 = 1\,000\,000$
megagram	Mg	mass	1 000 000 g
metre	m	length	base unit
metre per second	m/s	speed, velocity	3.6 km/h

Name of Unit or Prefix	Symbol	Quantity	Practical Equivalent
micro	μ	prefix	$10^{-6} = 0.000\,001$
micrometre	μm	length	10^{-6} m
milli	m	prefix	$10^{-3} = 0.001$
millilitre	mL	capacity	0.001 L
millimetre	mm	length	0.001 m
minute	min	time	60 s
minute (of arc)	'	angle	60' = 1°
mole	mol	amount of substance	base unit
mole per litre	mol/L	concentration	
newton	N	force	kg•m/s^2
newton metre	N•m	moment of force torque energy	1 J
ohm	Ω	electric resistance	V/A
pascal	Pa	pressure	N/m^2
pascal second	Pa•s	dynamic viscosity	
radian	rad	plane angle	πrad = 180°
radian per second	rad/s	angular velocity	$\frac{180^{\circ}}{\pi}$/s
revolution per minute	r/min	frequency	
revolution per second	r/s	frequency	
second	s	time	base unit
second (of arc)	"	angle	60" = 1'
siemens	S	electric conductance	A/V
square centimetre	cm^2	areas	0.00 1 m^2
square metre	m^2	area	10 000 cm^2
square metre per second	m^2/s	kinematic viscosity	
steradian	sr	solid angle	
tesla	T	magnetic flux density	Wb/m^2 or N/A•m
tonne (metric ton)	t	mass	1 000 kg
volt	V	electric potential	W/A or J/C

Name of Unit or Prefix	Symbol	Quantity	Practical Equivalent
volt	V/m	electric field strength	$10^{-6} = 0.000\,001 N/C$
watt	W	power	J/s
watt per metre kelvin	W/(m•k)	heat conductivity	
watt per square metre	W/m^2	heat flux density	
weber	Wb	magnetic flux	V•s or J/A
year (annum)	a	time	365.25 d

SUMMARY OF COMMONLY USED UNITS

Quantity	Unit	Symbol	Relationship
Length	kilometre metre decimetre centimetre millimetre	km m dm cm mm	1 km = 1 000 m 1 m = 10 dm = 100cm 1 dm = 10 cm 1 cm = 10 mm
Area	square kilometre hectare square metre square centimetre	km^2 ha m^2 cm^2	1 km^2 = 100 h 1 ha = 10 000 m^2 1 m^2 = 10 000 cm^2
Volume	cubic metre cubic centimetre	m^3 cm^3	1 m^3 = 1 000 000 cm^3
Capacity	kilolitre litre millilitre	kL L mL	1kL = 1 000 L 1 L = 1 000 mL
Concentration	mole per litre mole per cubic metre	mol/L mol/m^3	
Mass	megagram tonne (metric ton) kilogram gram milligram	Mg t kg g mg	1 Mg = 1 t 1 t = 1 000 kg 1 kg = 1 000 g 1 g = 1 000 mg
Time	day hour minute second	d h min s	1 d = 24 h 1 h = 60 min 1 min = 60 s
Velocity (Speed)	metre per second kilometre per hour	m/s km/h	1 m/s = 3.6 km/h
Density	kilogram per cubic metre tonne per cubic metre gram per cubic centimetre	kg/m^3 t/m^3 g/cm^3	1 t/m^3 = 1 000 kg/m^3 1 g/sm^3 = 1 000 kg/m^3
Density (of liquids)	kilogram per litre gram per millilitre	kg/L g/mL	1 kg/L = 1 000 kg/m^3 1 g/mL = 1 000 kg/m^3
Frequency	hertz	Hz	
Plane Angle	radian degree minute second	rad ° ′ ″	1 rad = $\frac{180°}{\pi}$ 1° = 60′ 1′ = 60″

Quantity	Unit	Symbol	Relationship
Amount of substance	mole	mol	
Electric current	ampere	A	
Electrical resistance	ohm	Ω	
Energy	J		
Force	newton	N	
Potential difference	volt	V	
Pressure	pascal	Pa	
Temperature	degrees Celsius	°C	

INTERRELATIONSHIPS

Excluding the mass of the container:

A cube 1 cm × 1 cm × 1 cm, if filled with water at 4 °C, holds 1 mL and has a mass of 1 g.

A cube 10 cm × 10 cm × 10 cm, if filled with water at 4 °C, holds 1 L and has a mass of 1 kg.

A cube 1 m × 1 m × 1 m, if filled with water at 4 °C, holds 1 000 L and has a mass of 1 t.

NUMERIC DATING*

Numeric dating is simply a means of expressing the date by means of numbers. The year, month and day in descending order of magnitude are expressed with 8 digits: 4 for the year, 2 for the month and 2 for the day. For example, April 7, 1975 can be expressed as 1975 04 07 or 1975-04-07.

The logic of this technique of recording a date becomes apparent when one is looking up past records that are arranged chronologically. One would first search for the year, then the month and finally the day.

24-HOUR TIMEKEEPING SYSTEM**

Sequence – The sequence of time elements in the 24-hour timekeeping system shall be:

hour minute second (if required)

Separator – A colon shall be used as the separator between hour and minute, and between minute and second.

Note: The symbols h, min, and s are not used because they are the symbols for hour, minute and second in the sense of duration or length of time. Thus 14 h 30 min expresses a measured time duration of fourteen hours and thirty minutes, while 14:30 refers to the time of day (i.e., two hours and thirty minutes past noon); 14 h 30 is ambiguous and should therefore not be used.

The absence of any separator (i.e., writing 14:00 incorrectly as 1400 or 1400 h) may give rise to the misleading practice of referring to that time as "fourteen hundred hours". It is suggested that, in speech, 14:00 may be expressed as "fourteen", "fourteen hours" or "fourteen zero zero".

e.g.,	Time	READ
	00:00	zero hour (instant of midnight, beginning of day)
	00:15	zero fifteen
	03:00	three hours
	16:30	sixteen thirty
	15:43	fifteen forty-three
	24:00	twenty-four hours (instant of midnight, end of day)

Note: Numeric dating and the 24 hour timekeeping system are not part of SI but are provided for general information.
When the figure 24 is used to represent the hour, it is never followed by any digits other than zeros.

* The Metric Guide
Council of Ministers of Education
Second Edition
March, 1976

** National Standard of Canada
All-Numeric Dates and Times
CAN3-Z234.4-79

MEASURING TOOLS AND UNITS OF MEASUREMENT CHART

Visit a local company and identify the types of measuring tools and the units of measurement used. Record your observations on the chart below.

Course: ______________________ Student's Name ______________________

Workplace Visited ______________________ Date ______________________

Types of Measuring Tools	Name of Units of Measurement	Metric	Imperial	Other
e.g., ruler	mm, cm, m	✓		

MATERIALS UNIT OF SALE CHART

Visit a local company that supplies materials. With the supervisor's permission, identify, through observation and discussion, the items usually sold by area, length, volume or mass. Record your observations below.

ITEM	SOLD BY:				UNIT OF MEASUREMENT	METRIC/ IMPERIAL
	Area	Length	Volume	Mass		
e.g., apples				✓	Kg	Metric
e.g., gasoline			✓		L	Metric

7. VISUAL SKILLS

The ability to use visual skills (e.g., observation, identification, recognition) and the related skill of interpretation are:

- **essential to the maintenance of safety in the workplace and in society**
- **necessary to monitor and maintain order and sequence in the home, the school and the workplace**
- **important to the creative dimension of many occupations.**

Charts and graphs are used to communicate information in an easy-to-read format.

The concepts, skills and attitudes related to visualizing developed in this unit include:

1. Identifies symbols common across occupational occupations.
2. Reads charts and graphs.

E 3. Shows creative potential.

RESOURCES

STUDENT RESOURCE

Working: Today and Tomorrow, Canadian Edition. Toronto, Ontario: Irwin Publishing, 1990.

Correlation of Learning Objectives with Student Resource

Concepts, Skills and Attitudes	*Working: Today and Tomorrow*
7. Visual Skills	Graphic representations (e.g., charts, graphs, illustrations) are contained throughout the text.

TEACHER RESOURCES

- Resource 28, "Hazardous Product Symbols"
- Resource 29, "Workplace Hazardous Materials Information Series Symbols (WHMIS)"
- Resource 30, "Signs and Symbols Record Chart"
- Resource 31, "Input, Process, Output Model"
- Resource 32, "Types of Graphs"
- Community Partners.

E = Elective Component

1. SIGNS AND SYMBOLS

Signs and symbols are frequently used in both the workplace and society to convey important information. Many commonly used symbols are used internationally. Learning an international symbol system reduces the need to speak, read or understand a foreign language in order to handle or use certain equipment, tools, materials or systems.

International symbols are used for:

- road signs
- hazardous products
- clothes cleaning instructions
- traffic control.

Other signs and symbols may be locally designed and used in workplaces.

In occupational courses where hazardous materials are commonly used (e.g., chemicals, gases, flammable liquids, explosives, corrosives) students must be able to recognize the nature of these materials from their symbols and to handle them properly.

Suggested Activities/Community Partnerships

1. a. Study the following charts:
    - Resource 28, "Hazardous Product Symbols"
    - Resource 29, "Workplace Hazardous Materials Information Series Symbols (WHMIS)".

   b. Using Resource 30, "Signs and Symbols Record Chart", identify and record the hazardous materials used and stored in the school lab or workplace.

   c. Describe the storage area of each hazardous product.

2. Invite community partners to discuss the use of signs and symbols in the workplace. Guests may include representatives from:
    - Alberta Consumer and Corporate Affairs
    - Alberta Occupational Health and Safety
    - Workers' Compensation Board
    - Fire department
    - Labour unions
    - Transport Canada
    - Warehouses
    - Parts departments of local businesses/industries.

2. CHARTS AND GRAPHS

Charts and graphs may be used to provide information about:

- trends (e.g., employment, weather, wages)
- sequence (e.g., tasks, events, activities)
- direction (e.g., communication flow, assembly)
- content (e.g., recipes, formulae, fares, taxes)
- performance (e.g., tasks completed, sales, achievement).

Almost any job can be represented as a series of tasks. Students should be encouraged to:

- follow the sequence of tasks presented as job sheet procedures in the student workbooks
- suggest alternative sequences (e.g., shortcuts, improvements)
- plan a project individually and/or cooperatively, using visual representations to outline the input, process, output stages of the project, including:
  - jobs to do
  - tasks involved in each job
  - responsible person(s) for each job/task
  - timelines
  - costs
  - checkpoints and evaluation procedures during and at the completion of the project.

Resource 31, "Input, Process, Output Model", may be used as a basis for project planning activities.

Suggested Activities/Community Partnerships

1. Study Resource 32, "Types of Graphs", and answer the following questions:

   a. Which graph shows the number of students enrolled in occupational courses?

   b. How many students are enrolled in Automotive Services?

   c. Which graph shows the annual rainfall in 1950?

   d. What was the approximate rainfall in 1970?

   e. How many thousands of houses were there in Anytown in 1965? 1980?

   f. Which type of graph do you prefer? Why?

2. Construct a chart that may be used to evaluate the finished product or service. (Evaluation charts provided in the student workbook may be used as a guide. The evaluation guide presented in Suggested Teaching Strategies, "Writing Directions" may also be used.)

E 3. VISUAL CREATIVITY

This learning objective is an elective component that may be used to provide enrichment or remediation for individual students.

This form of activity permits students to express themselves and to demonstrate a combination of their skills/abilities. These skills/abilities, often latent and undiscovered, may include:

- design ability
- artistic ability
- organizational ability
- leadership
- others.

Demonstrated abilities in one or more of these areas should be reinforced by the teacher, and students should be encouraged to take other courses in which these talents may be further developed.

Suggested Activities/Community Partnerships

1. a. In cooperation with a community partner (e.g., the teacher, mentor, parent), design and produce a project that may be useful to others. Projects may include:
    - making a sign, symbol or poster
    - craft work
    - construction design
    - volunteer work plan
    - advertising or marketing plan
    - window display
    - child care project
    - senior citizen assistance project.

   b. Display the project.

   c. Evaluate the project.

15.

Hazardous Product Symbols

Symboles des produits dangereux

The symbols below show the TYPE of hazard a product contains.

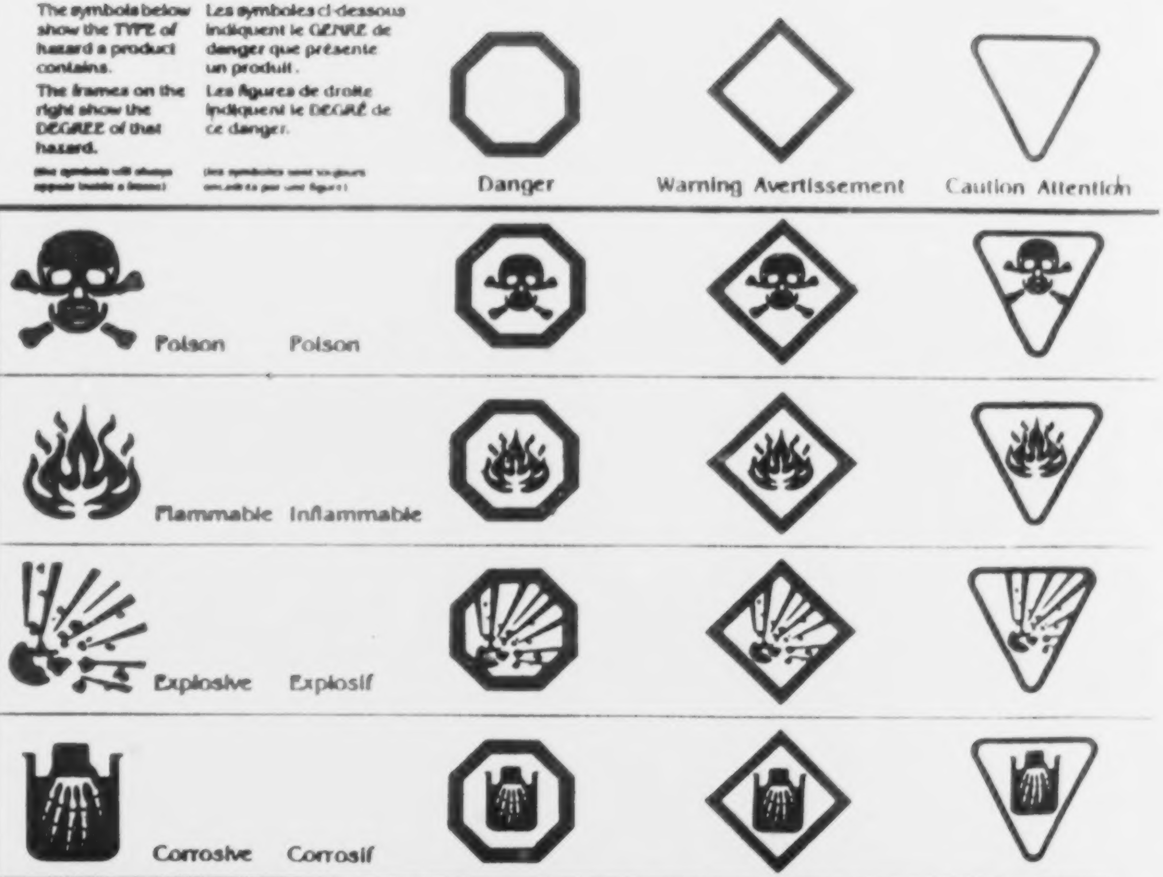
The frames on the right show the DEGREE of that hazard.

(the symbols will always appear inside a frame)

Les symboles ci-dessous indiquent le GENRE de danger que présente un produit.

Les figures de droite indiquent le DEGRÉ de ce danger.

(les symboles sont toujours encadrés par une figure)



Reminders

Keep the phone numbers and addresses of your doctor, the poison control centre or hospital and the fire department near your phone (see below). Make sure people in your home know where the numbers are.

If someone is poisoned, follow the instructions on the container. Keep the container with you when you go for help so that the doctor will know what caused the injury.

DON'T store these products in a cupboard under the kitchen sink or in a place where children can reach them.

À ne pas oublier

Gardez les numéros de téléphone et les adresses de votre médecin, du centre anti-poison ou de l'hôpital et des pompiers à proximité de votre téléphone (voir ci-dessous). Tous les habitants de la maison doivent connaître ces numéros.

En cas d'empoisonnement, suivez les instructions qui se trouvent sur le contenant. Emportez le contenant lorsque vous allez chez le médecin pour qu'il sache ce qui a provoqué l'intoxication.

N'entreposez PAS ces produits sous l'évier ou dans un endroit où les enfants peuvent les atteindre.

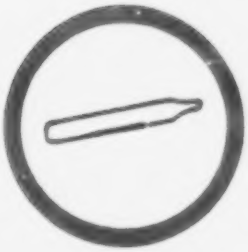
Emergency Numbers	Demandes de secours
Doctor Médecin	
Poison Control Centre anti-poison	
Ambulance Ambulance	
Fire Pompiers	

[illegible]

Consumer and Corporate Affairs Canada
Consommation et Corporations Canada

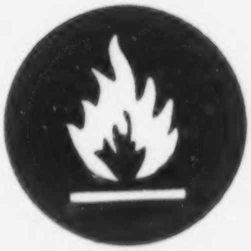
Canada

WHMIS Symbols



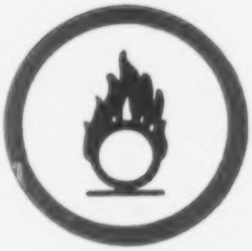
CLASS A

Compressed Gas



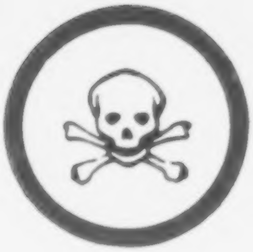
CLASS B

Flammable and Combustible Material



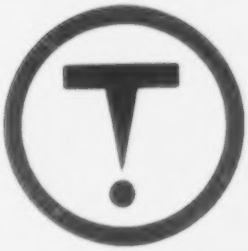
CLASS C

Oxidizing Material



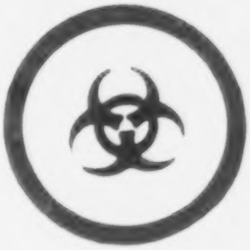
CLASS D

Poisonous Material



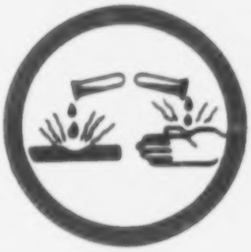
CLASS D

Toxic Material



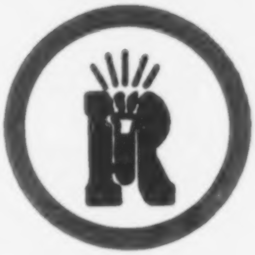
CLASS D

Biohazardous Infectious Material



CLASS E

Corrosive Material

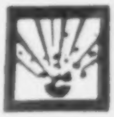


CLASS F

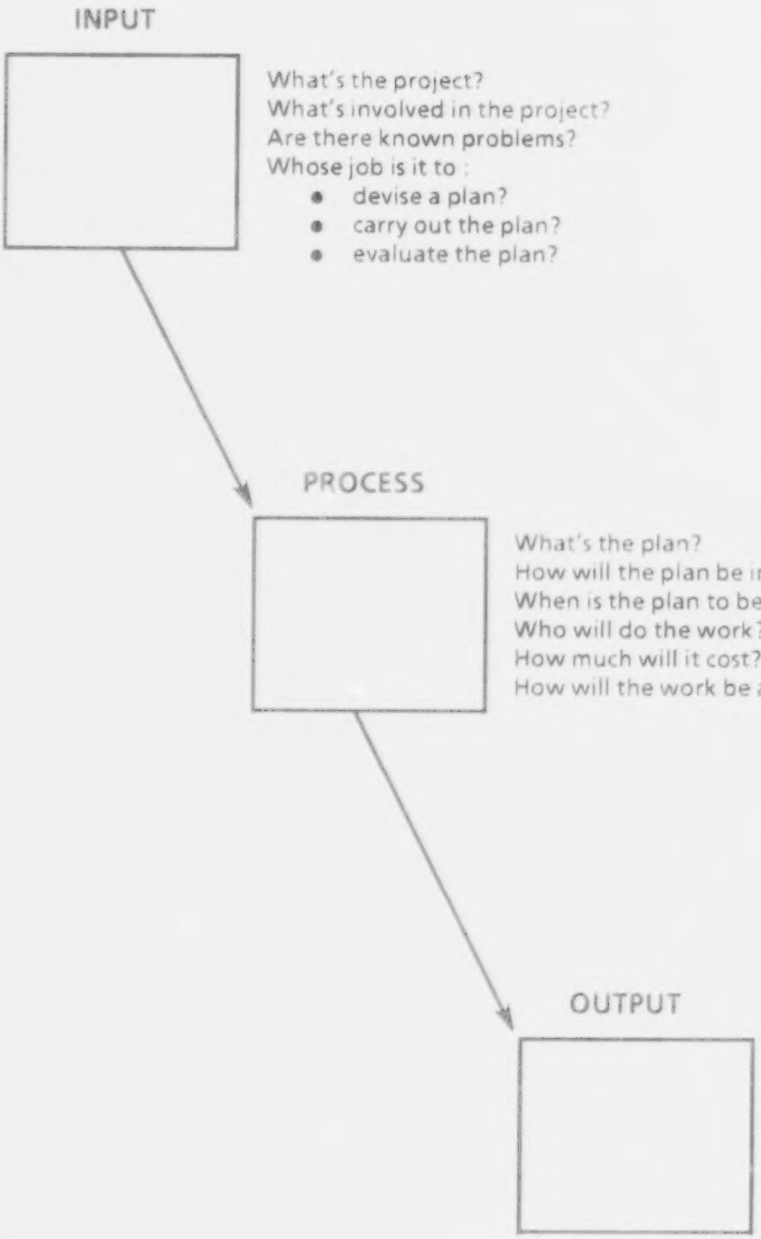
Dangerously Reactive Material

SIGNS AND SYMBOLS RECORD CHART

Using the signs and symbols resources provided, identify the hazardous materials used and stored in your lab or workplace. Record the symbol used on each item and describe the safe storage procedures followed.

HAZARDOUS MATERIAL	SYMBOL USED/MEANING	SAFE STORAGE PROCEDURE
e.g., 40 volume hydrogen peroxide	 Warning Explosive	Dark brown glass or synthetic container. Stored in cool, dark, closed cupboard.

INPUT, PROCESS, OUTPUT MODEL



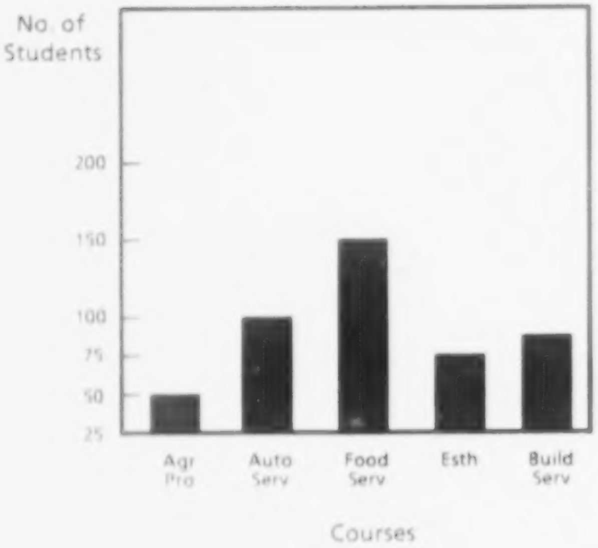
What's the project?
What's involved in the project?
Are there known problems?
Whose job is it to :

- devise a plan?
- carry out the plan?
- evaluate the plan?

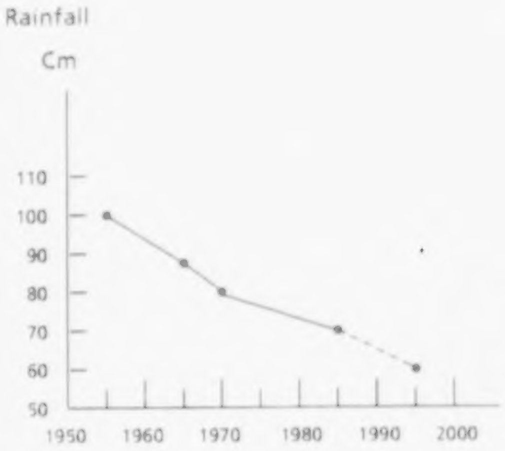
What's the plan?
How will the plan be implemented?
When is the plan to be completed?
Who will do the work?
How much will it cost?
How will the work be accomplished?

Was the plan achieved?
Is the product exactly as planned?
What changes could be made to improve the product or the way it was produced (e.g., time, cost, quality)?

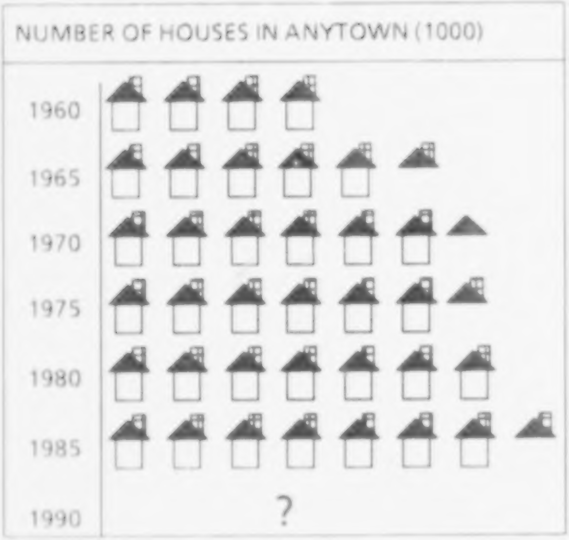
TYPES OF GRAPHS



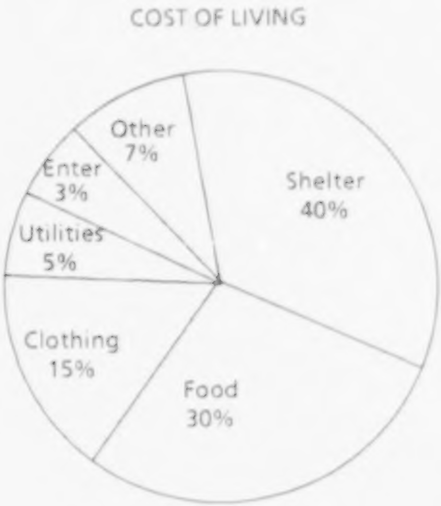
BAR GRAPH



LINE GRAPH



PICTOGRAPH



PIE GRAPH

8. ENTREPRENEURSHIP

Owning and operating a small business may be a realistic goal for students who attain an I.O.P. Certificate of Achievement. Teachers should encourage students to identify the potential areas for entrepreneurial activities within each occupational course.

The concepts, skills and attitudes related to entrepreneurship developed in this unit include:

1. Defines "entrepreneurship" and "entrepreneur".
2. Identifies small businesses in the community.
3. Recognizes entrepreneurship as a potential career path.

RESOURCES

STUDENT RESOURCE

Working: Today and Tomorrow, Canadian Edition. Toronto, Ontario: Irwin Publishing, 1990.

Correlations of Learning Objectives with Student Resource

Concepts, Skills and Attitudes	*Working: Today and Tomorrow*
8. Entrepreneurship	Chapter 5

TEACHER RESOURCES

- Resource 33, "Lifelong Entrepreneurship Education Model"
- Resource 34, "Prologue"
- Resource 35, "Role of Work Survey"
- Resource 36, "Characteristics of a Successful Entrepreneur"
- Community partners.

A variety of resources related to entrepreneurship and small business operations may be obtained from:

- Alberta Career Development and Employment
- Alberta Consumer and Corporate Affairs offices are located in the following areas:

Calgary	297-5700
Edmonton	427-5782
Grande Prairie	743-7231
Lethbridge	381-5360
Medicine Hat	529-3535
Peace River	624-6214
Red Deer	340-5241

- Canadian Foundation for Economic Education
  252, 3100 St. West
  Suite 7-205
  Toronto, Ontario
  M5S 1V5
  (416) 968-2236
- Canadian Organization of Small Businesses
  Suite 103, 10301 - 108 Street
  Edmonton, Alberta
  T5J 1L7
  (403) 423-2672
- Ministry of Industry Trade and Technology
  Province of Ontario
  Queens Park
  Toronto, Ontario
  M7A 2E1
- Junior Achievement
- Local newspapers – display and classified business advertisements
- Flyers announcing new business operations
- Copies of notice board advertisements offering entrepreneurial services
- Community partners.

1. ENTREPRENEURSHIP DEFINED

ENTREPRENEURSHIP is the planning, organizing and managing of a small business.

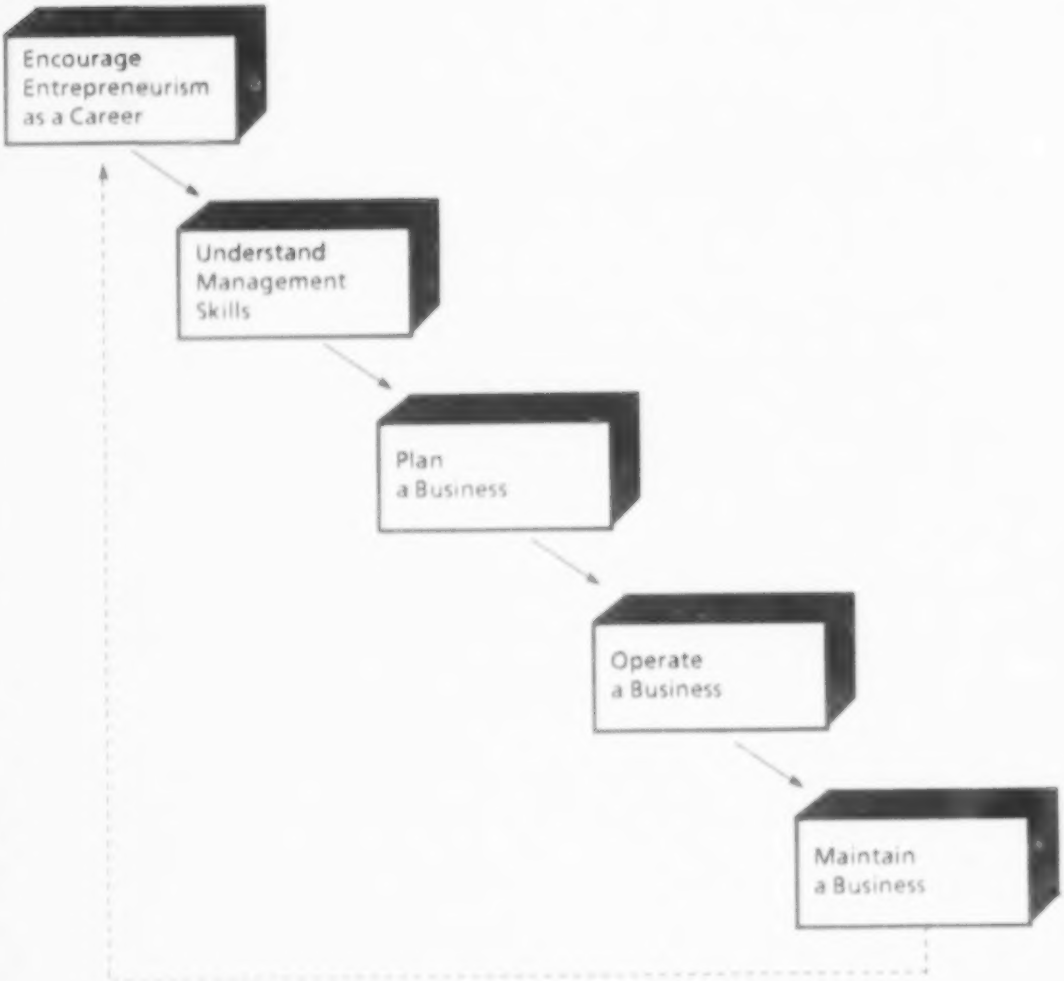
An ENTREPRENEUR is a person who is willing to take the risk of operating a small business.

Entrepreneurship is concerned with establishing and operating a small business (small businesses usually have from one to twenty employees). An entrepreneur is self-employed and tends to be independent, self-reliant, have drive, energy and a need for personal achievement. An entrepreneur may create a new product or service or develop a new and improved method to manufacture a product or provide a service. Every occupational cluster within the Integrated Occupational Program provides opportunities for entrepreneurship.

Small businesses are started and operated by people who:

- see a special need in the community
- have saleable skills
- have basic training in entrepreneurship
- know how to use their skills and training effectively.

Entrepreneurship is an evolving dimension in the areas of career and technology education. In recent years, educators and representatives from business and industry have cooperated to develop policies and plans to teach entrepreneurial skills. The basic program development model may be presented in flow chart form as:


Encourage Entrepreneurism as a Career
Understand Management Skills
Plan a Business
Operate a Business
Maintain a Business

Various models of entrepreneurship education provide perspectives on units of instruction and the developmental nature of entrepreneurship education. (See Resource 33, "Lifelong Entrepreneurship Education Model".)

Stage 1 of the Ohio State University model corresponds with the concepts, skills and attitudes addressed at the Grade 10 level in each occupational course in the Integrated Occupational Program. That is, to:

- identify career options
- understand basic free enterprise
- gain basic skills.

Stages 2 and 3 of this model correspond with the concepts, skills and attitudes that will be addressed in the Grades 11-12 curricula.

There are, of course, many other models of entrepreneurship education. The models, however, are significantly less important than the students' awareness of the potential for self-employment. Community partnerships provide role models to stimulate student interest in specific occupations, and have the potential to provide students with an awareness of entrepreneurial opportunities within an occupational area. (Resource 34, "Prologue" may be used to initiate discussion on the topic of entrepreneurship.)

Suggested Activities/Community Partnerships

1. Interview two or more entrepreneurs to find out how, when and why they started their businesses.

2. Discuss:
   - What are the advantages/disadvantages of operating one's own business?
   - What skills must be developed to operate one's own business?
   - What are some of the risk factors in operating a small business?

3. Using copies of Resource 35, "Role of Work Survey", survey a minimum of ten people in the community to find out their opinions on work, employment, and self-employment.

4. Invite a representative from Junior Achievement or another agency (e.g., YMCA, YWCA) to
   - suggest opportunities for enterprise
   - assist in developing student enterprises
   - assist in monitoring student enterprises.

2. SMALL BUSINESSES IN THE COMMUNITY
3. ENTREPRENEURSHIP AS A CAREER OPTION

There are small businesses in both small and large communities.

Small businesses may be operated to serve the needs of high school students; e.g., fast food outlets, candy, and school supply stores. Such business enterprises may sometimes be operated by high school students to sell goods and services to the community.

Suggested Activities/Community Partnerships

1. The following ventures are examples of entrepreneurial activities that may be undertaken in the context of the eight occupational clusters. Students may be encouraged to consider the appropriateness of these enterprises in the local context, and suggest other enterprises that may be more profitable.

   Agribusiness
   - lawn and garden care
   - bedding plant sales
   - basic lawn tools clean-up and maintenance.

   Business and Office Operations
   - concession operation at a school dance or sports event
   - telephone answering or messenger service
   - courier service.

Construction and Fabrication
- construct and sell:
  - wooden products
  - metal products
- handyperson services.

Creative Arts
- photographic services (e.g., takes photographs, enlarges negatives)
- craft production and sales.

Natural Resources
- firewood sales
- make specialized paper products from wood pulp.

Personal and Public Services
- aged care services
- child care services
- beauty care services
- laundry/ironing service.

Tourism and Hospitality
- food production and sales (e.g., sandwiches, baked goods)
- janitorial service
- window cleaning
- paper/flyer deliveries
- pet minding/sitting.

Transportation
- car wash service
- basic small-motor maintenance
- storage service.

2. Invite community partners to discuss the potential for enterprise in the local economy (e.g., Alberta Career Development and Employment, Chambers of Commerce, Bank and Credit Union Managers).

3. a. Using the local telephone directory, newspaper and flyer advertisements, bulletin boards, etc., identify three local small businesses that have opened in the past two years.

   b. Describe each of the businesses.

   c. Into which occupational cluster would each small business fit.

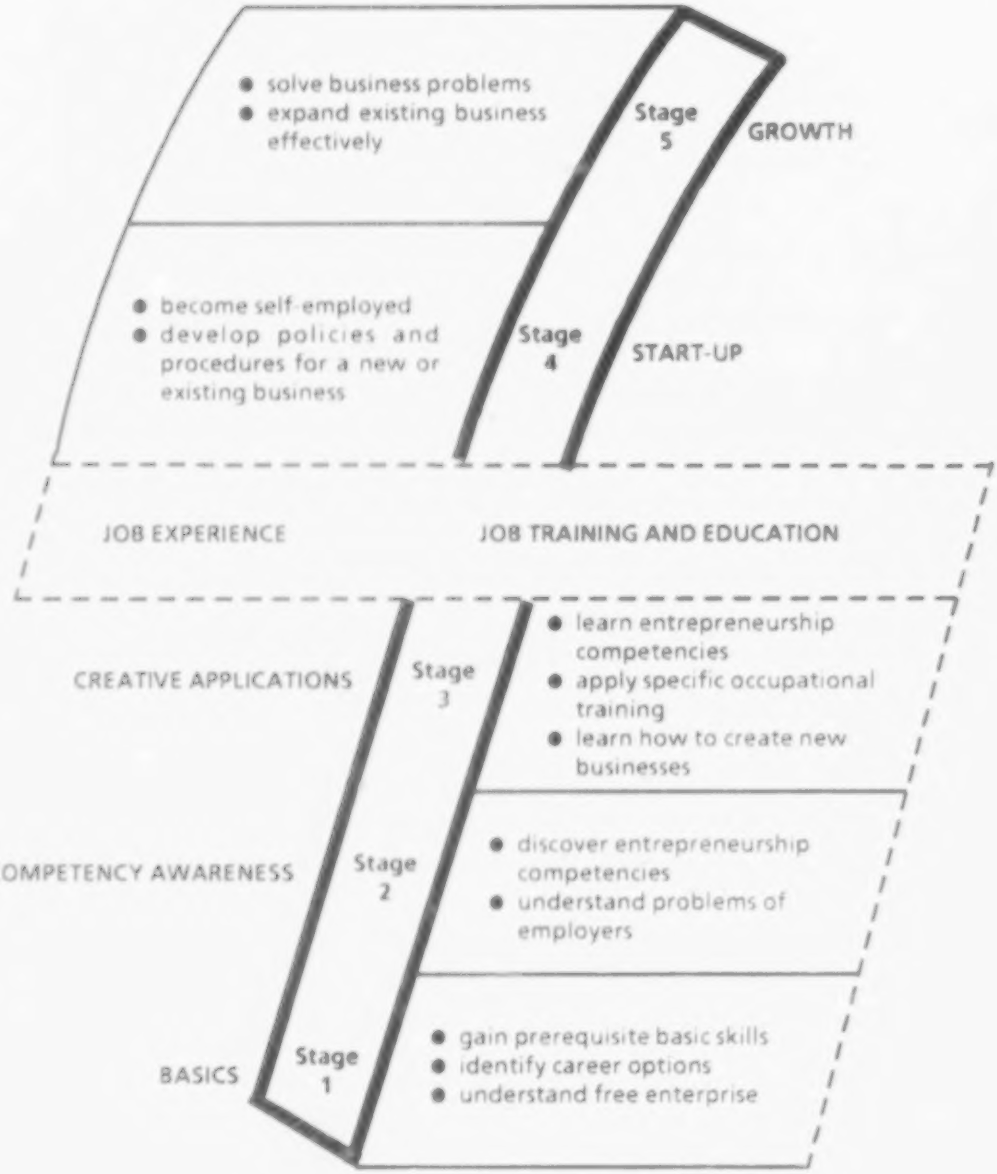
   d. Based on your observations, which of the three small businesses is the most successful? Give reasons for your answer.

4. a. If you had the opportunity to start planning your own small business, what type of business would you choose to start? Why?

   b. What would you need to start this small business? (e.g., knowledge, skills, attitudes, equipment, supplies)

5. Brainstorm: "What are the characteristics of a successful entrepreneur?" (See Resource 36, "Characteristics of a Successful Entrepreneur".)

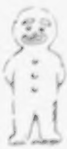
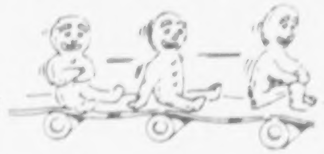
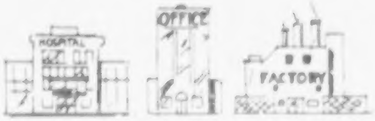
LIFELONG ENTREPRENEURSHIP EDUCATION MODEL


solve business problems
expand existing business effectively
Stage 5
GROWTH
become self-employed
develop policies and procedures for a new or existing business
Stage 4
START-UP
JOB EXPERIENCE
JOB TRAINING AND EDUCATION
CREATIVE APPLICATIONS
Stage 3
learn entrepreneurship competencies
apply specific occupational training
learn how to create new businesses
COMPETENCY AWARENESS
Stage 2
discover entrepreneurship competencies
understand problems of employers
BASICS
Stage 1
gain prerequisite basic skills
identify career options
understand free enterprise

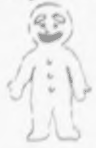
Source: Ohio State University (1980)

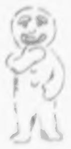
Adapted from New Directions for Vocational Education. Copyright M. Cathrine Ashmore, 1986, National Centre for Research in Vocational Education, Ohio State University.

PROLOGUE

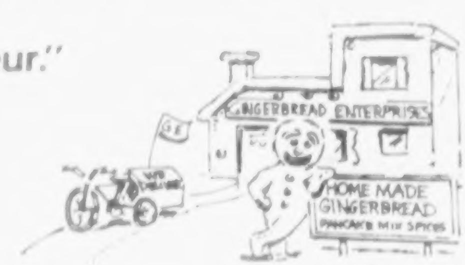
Once upon a time an enterprising  woke up and realized that most of the  were choosing standard careers in places like 

HOSPITAL
OFFICE
FACTORY

The enterprising  said, "I don't want to work for others, I'd rather be my own boss."

So the enterprising  decided to become a small business owner, an entrepreneur.

The went running away, calling, "Come and join me. Be an entrepreneur."



GINGERBREAD ENTERPRISES
HOME MADE GINGERBREAD
PANCAKE MIX SPICES

From *Are You Cut Out to be an Entrepreneur*, p. 3. Copyright Alberta Career Development and Employment. Reprinted by permission.

ROLE OF WORK SURVEY

PROCEDURE

1. Make at least ten copies of the survey form.
2. With your teacher's/supervisor's permission, visit a local shopping centre, mall or market and ask ten randomly selected people to respond to the survey.
3. Record their responses, using the key indicated.
4. Analyze the results, using basic mathematical procedures (e.g., average, percentage).
5. Discuss and compare your findings with classmates.

Permission to conduct a survey should be obtained from appropriate persons (shopping centre/mall manager, or local police if survey is to be conducted on a street).

Role of Work Survey

Student: ____________________ Date: ______________

Record people's responses according to the following key:
1 = Most important reason
2 = Less important reason
3 = Least important reason.

1. Why do most people work:
   - (a) to earn money? ☐
   - (b) to get fulfilment? ☐
   - (c) to pass the time? ☐

2. Why did you choose your present work:
   - (a) enjoy the work? ☐
   - (b) earn "big" money? ☐
   - (c) hours of work? ☐

3. Are most people:
   - (a) happy with the work they do? ☐
   - (b) bored with the work they do? ☐
   - (c) wanting a new job? ☐

4. Which would you prefer:
   - (a) to be employed? ☐
   - (b) to be self-employed? ☐
   - (c) to be employed and have a small business? ☐

Additional Information:

Sex (Tick one)
Male ☐
Female ☐

Age Range (Tick one)
15 - 25 ☐
26 - 40 ☐
Over 40 ☐

Thank you for participating in this survey.

Teacher/Supervisor: ______________________

Analysis of Responses

1. For each of the four questions:

   - Add the "1" responses
   - Add the "2" responses
   - Add the "3" responses

2. Calculate the percentage of ("1", "2" and "3") responses for each question.

3. Based on your calculations, answer the following questions:

   a. Why do most people work?

   ____

   ____

   b. Why did most people choose their present work?

   ____

   ____

   c. Are most people happy or bored with the work they do?

   ____

   ____

   d. What percentage of the people surveyed want a new job? Suggest reasons.

   ____

   ____

   e. Given the choice, would people prefer employment, self-employment or some combination of both?

   ____

   ____

   f. - What was the average age of these surveyed? ______________
      - What percentage were 15-25 years of age? Over 40 years of age? ______________

   g. What percentage of those surveyed were male? Female? ______________

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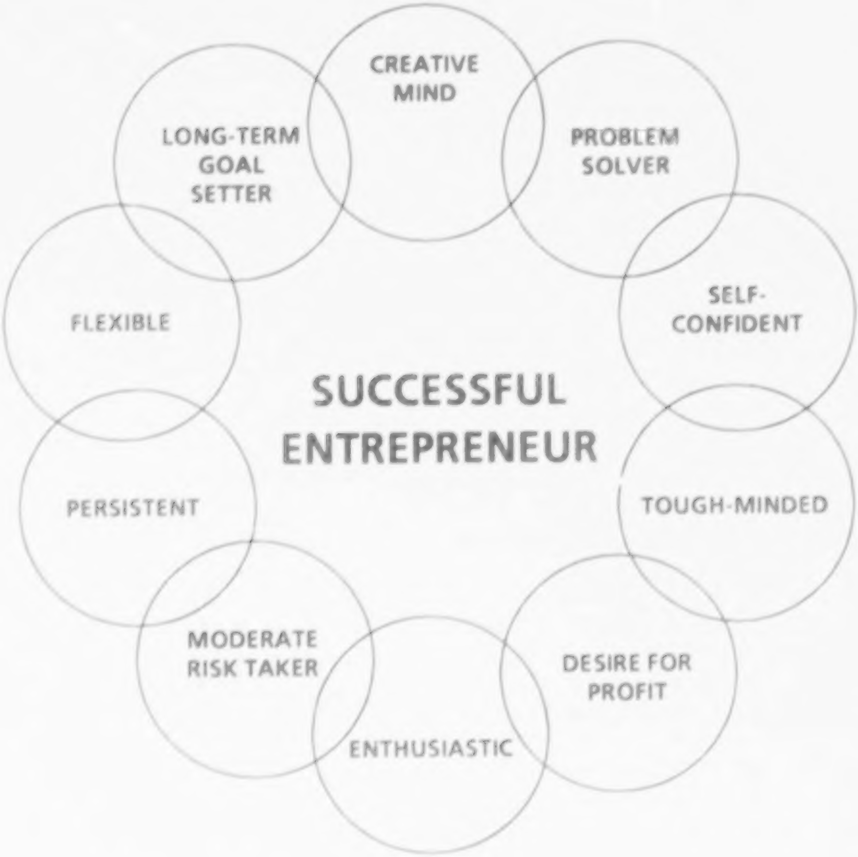
CHARACTERISTICS OF A SUCCESSFUL ENTREPRENEUR


CREATIVE MIND
PROBLEM SOLVER
SELF-CONFIDENT
TOUGH-MINDED
DESIRE FOR PROFIT
ENTHUSIASTIC
MODERATE RISK TAKER
PERSISTENT
FLEXIBLE
LONG-TERM GOAL SETTER
SUCCESSFUL ENTREPRENEUR

From *Entrepreneurship in the Alberta Curriculum: A Monograph*. Copyright by Alberta Education, 1988.

9. COMMUNITY PARTNERSHIPS

Broadly defined, "a community partnership" is an agreement between a school and the private sector to a mutually acceptable set of purposes and a means for achieving such purposes. Community partnership is based on the belief that educators can enhance students' learning experiences by bringing the community into the school and by taking the students out into the community.

As students become increasingly involved in community partnerships in their schooling, the first-hand experiences enhance their appreciation of the need for basic computational, communication and social skills in order to achieve on-the-job success. As students see the increased need and relevance of acquiring these skills, they become more motivated to achieve.

The primary interactive functions of community partnerships are to stimulate students' interests and to assist them to:

- learn about life
- learn about careers
- learn how to learn
- learn by doing
- learn about others
- learn about self.

Community partnerships have two dimensions:

- **In-school partnerships:** guest presentations, demonstrations, customer services, etc.
- **Field experiences:** students engage in job shadowing and other on-the-job learning experiences within the community.

Specific procedures and legislation about work experience education (community partnership) is provided in the current Alberta Education *Program Policy Manual* available upon written request from Central Support Services, Box 14, 11160-Jasper Avenue, Edmonton, Alberta, T5K 0L2.

Both dimensions are integral components of each course in the Integrated Occupational Program. In Grade 10, increased emphasis should be given to the field experience dimension. Through real life, on-the-job experiences, students may be better able to see the need for and relevance of their core courses and to develop both transferable and occupation related knowledge, skills and attitudes, including the ability to demonstrate:

- good work habits
- safety and sanitation practices
- pride in self
- pride in work
- respect for others
- respect for the property of others.

In Grade 10 level, community partnerships should comprise no less than twenty percent of each occupational course.

The concepts, skills and attitudes addressed in this unit reinforce those described in Unit 1, "Introductory Skills", and Unit 2, "Organizational Skills". These include:

1. Participates in field experiences.

2. Demonstrates satisfactory behaviour during community partnerships.

RESOURCES

STUDENT RESOURCE

- *Working: Today and Tomorrow*, Canadian Edition. Toronto, Ontario: Irwin Publishing, 1990.

Correlation of Learning Objectives with Student Resources

Concepts, Skills and Attitudes	*Working: Today and Tomorrow*
9. Community Partnerships	Chapter 3

TEACHER RESOURCES

- *Integrated Occupational Program: Information Manual for Administrators, Counsellors and Teachers*, Alberta Education, 1989.
- *Integrated Occupational Program: Student Workbooks*. (A workbook is available for each Grade 10 I.O.P. course.)
- *Work Experience Program: Teacher Resource Manual Junior and Senior High School*, Alberta Education, 1990.
- Resource 37, "Community Partnership: Student Evaluation Form"
- Community partners including:
  - Junior Achievement
  - Local businesses, industries and volunteer agencies.

Suggested Activities/Community Partnerships

The *Occupational Component 16-Level Courses, Program of Studies/Curriculum Guide* and the student workbooks available for each occupational course suggest community partnership activities including a number which focus on providing students with field experiences. Teachers are encouraged to complement and supplement these community partnerships with others that best meet the needs and interests of their students and the availability of partners in the community.

In considering potential community partners, it is important that each be given an understanding of the specific educational purposes for which you are asking their assistance, and some insight as to the needs and abilities of your particular students. In many cases, the nature of the school program may be unfamiliar to potential community partners. It is thus worthwhile to discuss your course at some length and perhaps to provide an outline of your plan for the topic. (Reproduction of a portion of this teacher resource manual and the student workbook may be helpful in this way.)

General areas in which community partners may be most valuable include:

- identifying and demonstrating specific operations that are involved in a particular industry
- describing the planning and decision making that take place in the industry
- identifying factors that influence planning and operations and how these operations influence the larger community
- describing the kinds of activities that are involved in particular careers.

At the conclusion of each field experience, Resource 37, "Community Partnership: Student Evaluation Form", should be used by the community partners and the teacher to record the student's performance. The form may also be used to encourage students to evaluate their own performance and to assess their progress over time.

COMMUNITY PARTNERSHIP: STUDENT EVALUATION FORM

STUDENT ____________________

COMMUNITY PARTNER ______________

TYPE OF BUSINESS ________________

Period of Partnership
From _____ to _____

	PERFORMANCE LEVEL			
	High	Med	Low	N.A.
1. Career Awareness (a) Recognizes nature of the industry/business (b) Identifies variety of jobs in occupation (c) Recognizes need for job search skills (d) Identifies job requirements (e) Dresses appropriately for the job				
2. Human Relations (a) Maintains good relations (b) Communicates effectively (c) Practises ethical behaviour (d) Demonstrates dependability (e) Demonstrates interest in area (f) Identifies work standards (g) Displays a positive attitude (h) Respects the opinions and property of others				
3. Core Skills (a) Follows instructions/directions (b) Completes necessary forms (c) Uses metric/imperial measures (d) Uses basic math functions (e) Uses tools and equipment properly				
4. Work Skills (a) Demonstrates appropriate competencies (b) Demonstrates pride in work (c) Demonstrates work area sanitation (d) Demonstrates basic safety practices (e) Shows initiative (f) Shows creative ability (g) Practises effective time management				
5. Entrepreneurship (a) Identifies possible self-employment opportunities				

Teacher: ________ Student: ________ Community Partner: __________

10. WORK SKILLS

The work skills identified in the *Occupational Component 16-Level Courses, Program of Studies/Curriculum Guide* are generic to each of the courses that comprise the occupational component of the Integrated Occupational Program.

The work skills that should be addressed in each occupational course provide the context in which the generic skills described in Units 1–9 are learned and reinforced. The work skills expanded upon in each Grade 10 occupational course include:

1. Identifies job scope.
2. Demonstrates safe use of equipment, tools and supplies.
3. Identifies and works to accepted standards.
4. Manages supplies efficiently.
5. Maintains work area in a safe and sanitary condition.

RESOURCES

STUDENT RESOURCES

- Student Workbooks

TEACHER RESOURCES

- Resource 38, "Work Habits: Self-Evaluation Chart"
- Resource 39, "Hand, Power, Measuring and Layout Tools Information, Job and Evaluation Sheets"
- Student workbooks
- Community partners.

Suggested Activities/Community Partnerships

A work skills profile, specific to each occupational course, is included in each student workbook. These profiles of work skills incorporate the generic work skills listed above and are designed to accommodate students' differences in interests, and to provide teachers with the flexibility to select, adapt and further develop course content to meet student needs, interests and resources.

Students may use a copy of Resource 38, "Work Habits Self-Evaluation Chart" to assess progress on a weekly or monthly basis.

Resource 39, "Hand, Power, Measuring and Layout Tools Information, Job and Evaluation Sheets" may be used in whole or in part in conjunction with the student activities and job sheets contained in selected student workbooks (e.g., agricultural mechanics, building services, construction services, crafts and arts).

WORK HABITS
SELF-EVALUATION CHART

Name: ______________________ Date: ______________ Course: ____________________

	EVALUATION Excellent → Poor		
Time Management	3	2	1
Arrives on time			
Brings all necessary equipment to class			
Prepares immediately for work			
Performs duties without being asked			
Uses extra time to complete unfinished work			
Considers solutions to problems before asking for assistance			
Completes work on time			
Task Management			
Uses equipment and implements as instructed			
Cleans work area after use			
Performs daily clean-up duties			
Follows lab/class rules and regulations			
Personal Management			
Is well groomed			
Wears clothing appropriate to the task			
Maintains accepted standards of personal and public hygiene			
Safety			
Takes all necessary safety precautions			
Uses appropriate safety devices (clothing, shields, guards, etc.)			

Best Score: 45 Score Attained:

Student's Signature: Teacher's Signature:

HAND, POWER, MEASURING AND LAYOUT TOOLS

INFORMATION, JOB AND EVALUATION SHEETS

ACKNOWLEDGEMENT

The contents of this resource were adapted from *TRAC Common Core Program, Learning Guides Lines F and G*. Alberta Education extends its appreciation for permission to print copyrighted material to the Ministry of Advanced Education, Training and Technology, Province of British Columbia.

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HAND TOOLS

TYPES OF HAND TOOLS

Basic hand tools are used by people in a variety of occupational areas, whether working in construction, agriculture, transportation, mining, forestry or the oil and gas industry. These basic hand tools include: hammers, pliers, wrenches, screwdrivers, chisels, files and punches.

Improper use of any of these tools can result in injury to oneself and to others. Using damaged tools is also dangerous. Damaged tools should not be used until they are properly repaired or replaced.

A number of commonly used hand tools are described in the following information sheets. Your teacher will demonstrate the correct way to handle and care for each tool. In addition, when you visit various workplaces you should observe the safe-use of hand tools in the hands of experienced workers.

KEY POINTS AND PROCEDURES

1. Tools must only be used for their intended use. If used for a job for which they were not designed, damage to the tool and personal injury may result.

2. Handles on tools must be firmly fixed and free from splinters, cracks or breaks. Keep cutting edges sharp. All tools having moving parts must be in good condition with the moving parts functioning properly. Tools in proper condition are safer to use and make the job easier. Defective tools should be repaired or replaced.

3. Use protective clothing:

    - Wear work gloves for tools that are rough, that require a great deal of handling, or where there is the possibility of injury to the hands.
    - Wear eye protection when using striking tools or tools that create material flare ups or dust.
    - Wear protective aprons or shin guards when using power saws.
    - Keep all protective equipment in proper place and in good condition.

4. Maintain good body position to prevent muscle strain or accidental contact with the tools, equipment, or materials. Keep a safe distance from possible hazards.

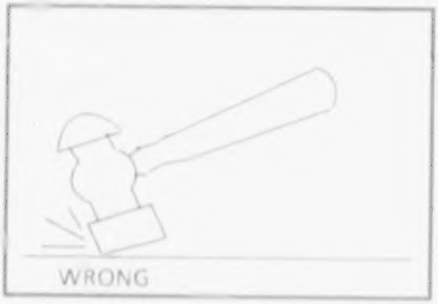
5. Carefully practice using the tool. Ensure that no material or equipment will come in contact with the movement of the tool. Moving a step in any direction requires a new check of the surroundings. This is very important with tools that have sharp edges and tools that are swung. Check the full area of the swing from back swing to follow through. Move any material or equipment that might be in the way. If this is not possible, move your work area.

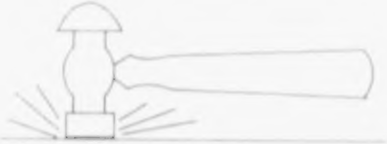
6. When using hand tools prepare for the unexpected, for example:

   - A wrench slipping from your grip
   - Loose material sliding down onto your hands
   - Loads slipping or anchors giving away when using lifting or pulling devices
   - Saws coming into contact with material or people

   These possible occurrences should be anticipated. However, the occurrence can be kept to a minimum with proper care, e.g., a change of grip or footing to maintain balance is usually all that is needed to prevent accidents.

7. Holding a hammer handle nearer the head reduces the force of the blow. Always strike the object with the centre of the flat face of the hammer. In this way you will protect the face edge from chipping as the blow is distributed over a larger area. All hammering should be started with light blows followed by heavy blows if necessary.


WRONG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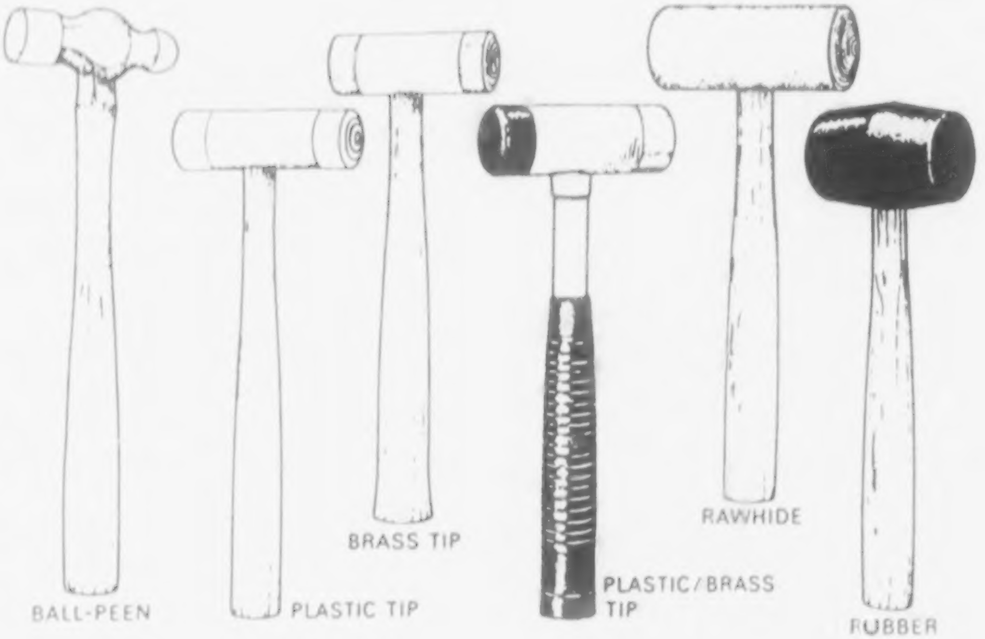
HAMMERS, MALLETS, AND WRECKING BARS

HAMMERS



Hammers are striking tools. You should be able to recognize and use correctly the several hammer types used in the trades and know which to select for different purposes.

Hammers are identified by the material and weight of the head. There are two groups of hammer heads, steel and soft face.

Most hammer handles are made from a hardwood such as hickory. A few handles are fiberglass or steel and have a nonslip rubber or plastic grip.

Fiberglass handles are stronger than wood handles and are not affected by most chemicals. Hammers, with the exception of some molded rubber mallets, have replaceable handles supplied with wood or steel wedges.

Never use a hammer with a loose head or a damaged handle. Serious injury can result if the head flies off or if the handle breaks.

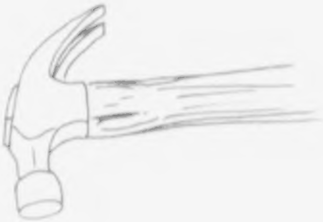
STEEL-FACE HAMMERS

The heads of steel-face hammers such as ball-peen hammers are made from high-grade alloy steel, heat-treated to a suitable degree of hardness. The ball-peen hammer generally has a slightly rounded (convex) striking surface, or face. The end opposite the face is a full half sphere and is called a peen. The hole, or eye, in the hammer head is tapered at both ends to hold the head firmly on the handle after a wedge is driven into the head end of the handle.

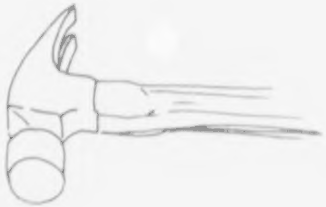
CLAW HAMMERS

Claw hammers are used to drive and pull nails. Their handles can be made of wood, fibreglass or steel. The size of a hammer is indicated by the weight of the hammer's head. A 454 g hammer is a general purpose hammer.

There are two types of claw hammers: curved claw hammers have claws designed for pulling nails while straight claw hammers are used for ripping apart wooden assemblies.



Curved Claw

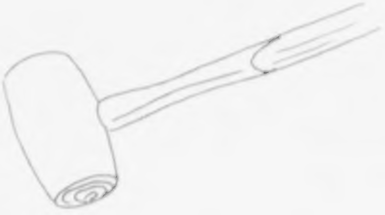


Straight Claw

Claw hammers should not be used to strike anything harder than ordinary nails. Hardened steel objects such as concrete nails could chip the face of a claw hammer, and these metal chips could cause injury or blindness.

WOOD MALLETS

Wood mallets are often used in conjunction with chisels. Mallets are available in a variety of weights, shapes and sizes. Their heads may be made of almost any hardwood which is not easily split. Hardwoods such as hickory, dogwood and ironwood are popular choices.



Wood Mallet

WRECKING BARS

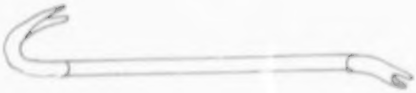
Wrecking bars are used to dismantle wooden structures such as scaffolds, concrete formwork or any item too large for a claw hammer. Large nails and spikes are much easier to pull using a wrecking bar then a hammer.

There are several styles of wrecking bars. The most common ones are:

Goose Necks

The goose neck ranges from 500 to 1000 mm in length. It has a set of nail claws at the end of a pronounced curved end. The claws are used to pull nails while the curve provides great leverage. Use a goose neck rather than a pry bar to pull spikes and very large nails.

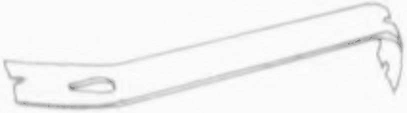
Goose necks have a flattened portion at the end opposite the nail claws. This flattened portion is used to pry apart two pieces of wood.



Goose Neck

Pry Bar

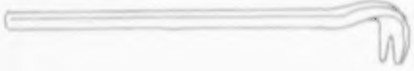
The pry bar is a smaller version of the goose neck and is made of flat spring steel. It too is used to pry apart wood structures and to pull nails. Its length is around 400 mm and it is more easily carried around than a goose neck; however, its shorter length reduces the leverage offered by longer wrecking bars.



Pry Bar

Nail Claws or Nail Pullers

A nail claw or nail puller is a short bar designed to extract nails driven flush or below the surface. Commonly known as a "cat's paw", it is designed so its claws can be pounded below the surface of the wood to grip nails and then pry them above the surface where they can be extracted with a claw hammer. The "cat's paw" is usually 250 mm to 300 mm in length.



Cat's Paw

SAFE-USE PRACTICES

1. Use a hammer only if it is in good condition and with head firmly attached to the handle. Be certain both hammer handle and your hands are clean to avoid loosing your grip on the handle. Hammers with damaged heads, loose or broken handles, should be repaired or replaced. Apply glue before you drive your wedge into a handle. Never use nails for wedges.

2. Grip the handle close to end. "Choking" is awkward, increases chances for a smashed finger, and also makes for a less effective blow.

3. Always wear safety goggles while using a hammer. Driving nails, a flying nail or other flying material can cause the loss of an eye.

4. Always keep your mind on your work, to avoid hitting your fingers. For example, start driving nails by holding them near the head and hitting the nail with a light blow. This will minimize the possibility of flying nails and finger injuries. Use a flat-faced hammer to drive nails.

5. Hammer handles are meant for gripping only. Don't tap objects with them or use them as pry bars.

6. Don't use a wrench, rod, bolt or other piece of equipment in place of a hammer. Never strike hardened objects, such as a wrench or another hammer, with anything except a rawhide or soft-metal hammer.

7. Be sure you have an unobstructed swing when using a hammer. In particular, watch out for overhead obstructions and other workers who may be beside or behind you.

8. Have a helper use tongs or another proper holding device when holding work to be hit with a sledge hammer. Be sure no one is standing within range of your swing when using a sledge hammer. Both workers should wear goggles.

9. There is a proper type of tool for every job, always select the correct one. Never use a makeshift piece of equipment in place of a hammer, mallet or wrecking bar.

PLIERS

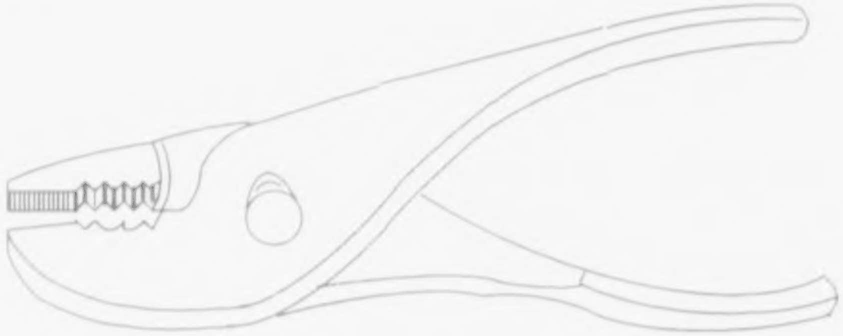
Used correctly and safely, pliers can be used to perform many tasks including holding, gripping, cutting and crimping. There are literally hundreds of different kinds of pliers, each designed for a special purpose. As with any tool, pliers should be maintained in good working condition by keeping them well oiled and clean.

Top quality pliers are forged from hardened steel and machined to close tolerances. Some have honed cutting edges and are polished, adjusted and subjected to detailed inspection before being marketed.

Pliers are classified by their type, and by their overall length, which can vary from 10 cm to 50 cm.

COMBINATION SLIP-JOINT PLIERS

Combination slip-joint pliers are the most common general purpose pliers. They can be adjusted to two or more sizes by means of a sliding pivot which allows the jaws of the pliers to open widely for gripping items of larger diameters. The jaws have sharp, hardened cross teeth to grip the object on which you are working.

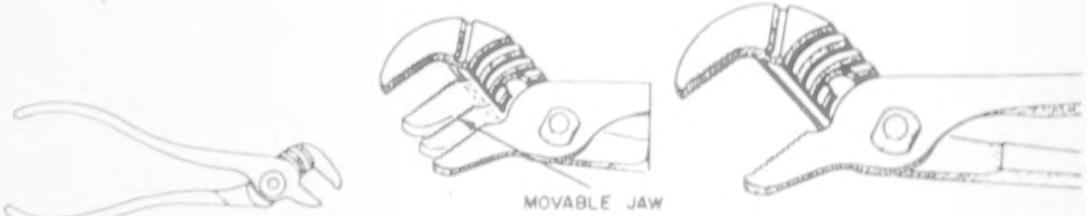


Combination Slip-Joint Pliers

Never use pliers for turning nuts or bolts; the pliers' sharp teeth will round off the corners and badly mar the nut or bolt.

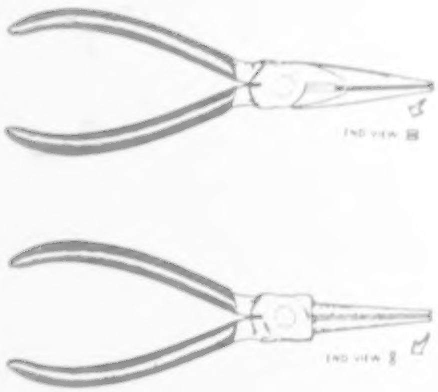
INTERLOCKING SLIP-JOINT PLIERS

Interlocking slip-joint pliers are a popular variation of the combination slip-joint pliers. These pliers are very useful for gripping large or hard-to-get-at objects. They can be opened to a number of positions while the jaws remain parallel to each other. Because of the large bite available with these pliers, the handles are made longer to provide greater leverage. They are also available in a miniature size.



Interlocking Slip-Joint Pliers

NEEDLE-NOSE AND ROUND-ROSE PLIERS



Needle-Nose and Round-Nose Pliers

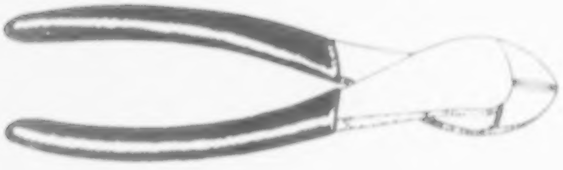
Long or needle-nose pliers are very useful for getting at those small, hard-to-reach areas. They come in a variety of sizes and styles, some incorporating a cutting surface for cutting wire. Needle-nose pliers are used for a variety of jobs such as electrical and carpentry work.

Many needle-nose pliers have rounded jaws that are useful in blending wire into curves or circles. These are called round-nose pliers.

Be sure to use pliers with insulated handles when working near electrical outlets or appliances to prevent possible electric shock. These handles are coated with rubber, vinyl or other insulating material.

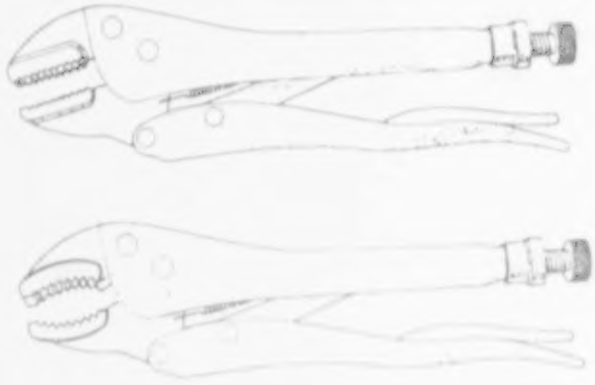
DIAGONAL OR SIDE-CUTTING PLIERS

Diagonal or side-cutting pliers are pliers made with a diagonally cut head or face and a hard steel cutting edge. They are used to cut wire or other metal objects close to the surface.



Diagonal Cutting Pliers

LOCKING PLIERS



Locking or Vice-Grip Pliers

Locking pliers or vice-grip pliers as they are commonly known, are useful for holding work together while another task is being performed on the work.

The straight jaw vice-grip pliers can be especially useful for holding nuts stationary while removing a tight bolt.

SAFE-USE PRACTICES

1. Pliers use should be limited to operations for which they were designed e.g., gripping and cutting.

2. Pliers should not be used for bolt turning work because:

   - their jaws are flexible.
   - they leave tool marks on the nut or bolt head, often rounding the corner so much that it becomes extremely difficult to service the fitting in the future.

3. The inside of cutting jaws should point away from the user's face to prevent injury from flying cuttings.

4. For a firm grip with minimum of effort, use the right size of pliers and correct body position.

5. Pliers, like all tools, should be kept clean by regular maintence. Placing a drop of oil on the joint pin cuts down wear and prevents rusting which is an enemy of all tools.

SCREWDRIVERS

SCREWDRIVERS

Screwdrivers should be used only for: turning screws. They should never be used as prying tools, punches, scrapers, can openers or chisels. Misuse will make the screwdriver useless for their intended purpose.

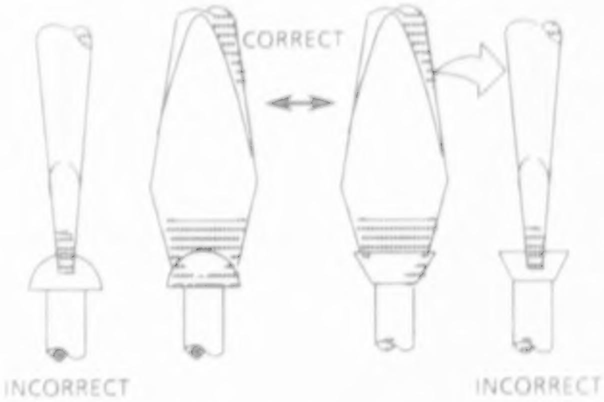
Screwdrivers are available in a variety of lengths and handle sizes. Larger diameter handles provide for greater turning power while smaller diameter handles increase the speed at which screws can be turned.

The length of a screwdriver is measured by the length from its handle to its tip. Lengths range from 1.25 cm to 30 cm or more, with the shorter lengths known as stubbies. Stubbie screwdrivers are used only when space will not permit use of longer screwdrivers. As a general rule, the longer the screwdriver the easier it is to use.

BLADE SCREWDRIVERS

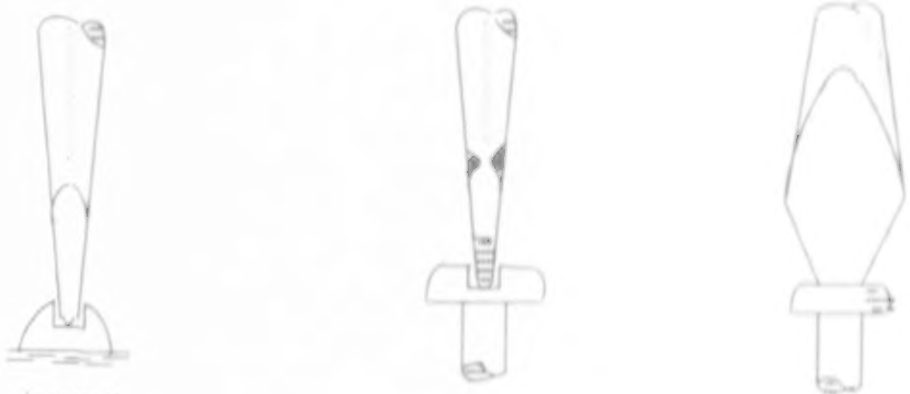
Screw heads with a single slot are designed to be turned with a blade screwdriver. Always use the correct size of screwdriver blade for round-head or flat-head screws.

The thickness of the blade must match the width of the screw slot and that the width of the blade must match the length of the screw slot.



Blade Screwdrivers and Screwheads

The tip of the blade screwdriver should be ground so that the wide faces are flat and near parallel. Rounded tips tend to climb out of the slot when force is applied. Similarly, a screwdriver blade which is too narrow and too thin for the screw slot will slip out of place. Both situations may cause damage to the screw head and the screwdriver blade.



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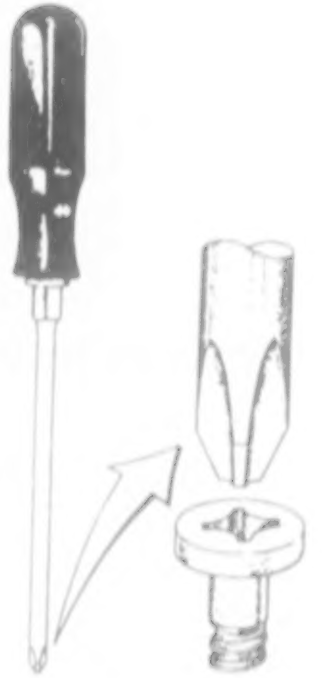
Blade Screwdrivers and Screwheads

PHILLIPS SCREWDRIVERS

The Phillips screwdriver is available in four sizes which are numbered 1, 2, 3 and 4.

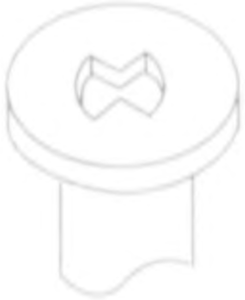
The size of the tip must match the size of the slots in the screw head.

If the screwdriver tip is too large for the screw, it will not engage. If the tip is one size too small, it will engage but damage to both screwdriver and screw head will occur when force is applied.



Phillips Screwdriver

CLUTCH SCREWDRIVERS



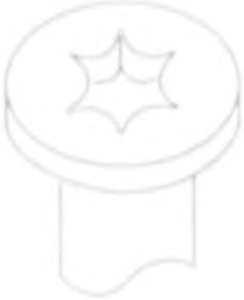
Clutch-Type Screw Head

Clutch-type screw heads are popular in the automotive industry. There are six sizes of tips in use, ranging from 2.5 mm to 8 mm.

The screwdriver tip must match the screw head exactly.

Clutch head screwdrivers are less prone to slipping out of the screw head than are blade or Phillips types and the shape of the tip makes them extremely strong.

TORX SCREWDRIVERS



Torx Screw Head

Torx screwdrivers are available in a variety of sizes. The tips are extremely strong and are designed to be used with powered screwdrivers.

Torx screw heads may appear to fit Allen wrenches, but you will find that as soon as any force is applied, the corners of the wrench or the screw will be damaged. Never use an Allen wrench on Torx screws.

Both the clutch and Torx screwdrivers engage the screw snugly enough to support the screw on the end of the screwdriver.

SAFE-USE PRACTICES

1. It is important to keep screwdrivers in good condition:
   - handles should be smooth, undamaged but not slippery
   - handles should provide a good grip
   - shanks should be true and straight

2. Select the correct type and size screwdriver for each task.

3. Do not use a screwdriver with a worn, chipped or broken tip. Keep the tip filed, (where appropriate.)

4. Never hammer on a screwdriver; it may chip or crack.

5. For electrical work, use a screwdriver with an insulated handle.

6. Store each screwdriver in its proper place to prevent damage, loss or misuse.

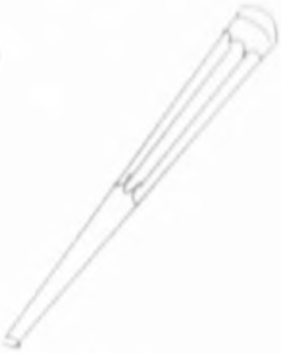
INFORMATION SHEET #4

PUNCHES

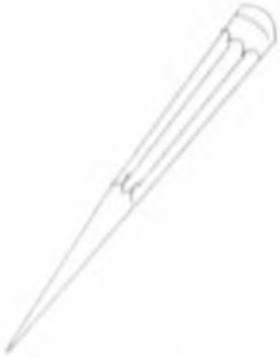
PUNCHES

Punches are used to make a mark on an indentation (dent) in a piece of stock, e.g., wood, metal, plastic. Two commonly used punches are the centre punch and the prick punch.

Taper punches are sized according to their length, and come in various lengths from 15 cm to 35 cm. One of the main uses for this punch is as a starting punch. As the term implies, it is used to start driving rivets, pins or bolts out from a hole in a component.



Taper Punch

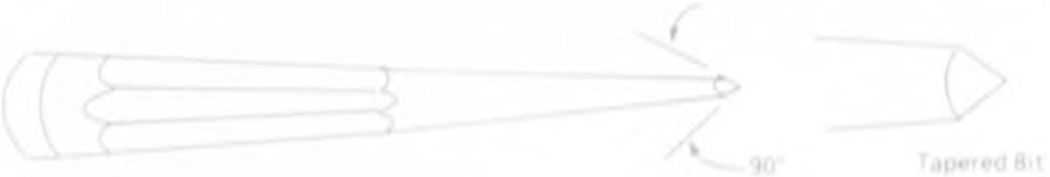


Pin Punch

The pin punch is necessary because the taper on the taper punch will not allow it to follow the object through the hole to completely remove it. Pin punches also come in various lengths as well as punch shaft diameters. Large pin punches are sometimes referred to as drift punches and are used for applications where considerable force is required (e.g., large shafts.)

CENTRE PUNCH

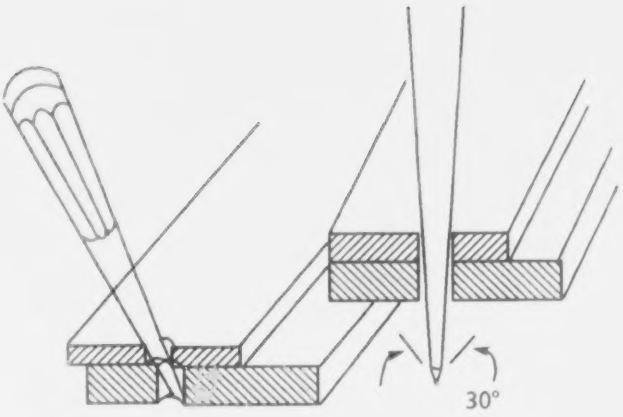
The centre punch has a tapered bit with a broad, sharp point. It is used primarily for punching an indentation in a piece of metal as a guide for starting a drill bit. For example, you would first mark the part to be drilled with a scriber or pencil, and then place the centre punch directly on this mark. With a hammer, strike the head of the punch a good sharp blow. The indentation in the material will prevent the tip of the drill from slipping out of position, thus making it easier to start your drill.



PRICK PUNCH

The prick punch is used to make a small mark at the intersection of two layout lines. When satisfied that the mark is in the correct location, a centre punch can then be used to enlarge the hole to the shape and size appropriate for a twist drill.

A prick punch can sometimes be used to align holes. By inserting the long slim taper of the prick punch in holes drilled through several pieces of metal, the holes can be lined up by wiggling the punch back and forth. As the punch works deeper into the holes the pieces of material shift and the holes are aligned.



Prick Punch

The points of prick punches are ground to an included angle of 30°. This gives the prick punch a very thin point which makes it easy to see where you are placing the sharp point on a workpiece.

SAFE-USE PRACTICES

1. The point on a centre punch should be ground to a true taper point central to its shank.

2. Store punches carefully; the points are easily damaged through misuse.

3. Do not use a centre punch on materials which are so hard that the material may wear the point of the punch.

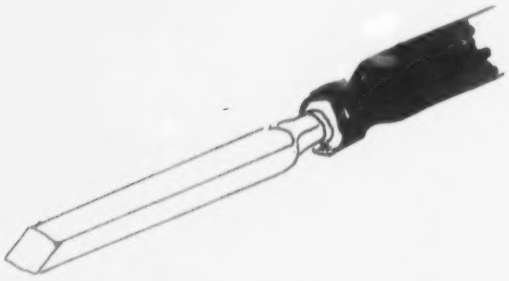
CHISELS

Chisels may be made from square, rectangular, hexagonal, and octagonal high carbon steel stock. The steel is machined, then hardened and tempered. The body and head are softer than the cutting edge so that they can withstand a striking force without chipping. The upper end of a chisel has a slight taper (chamfer) to compensate for the mushrooming caused by repeated hammer blows.

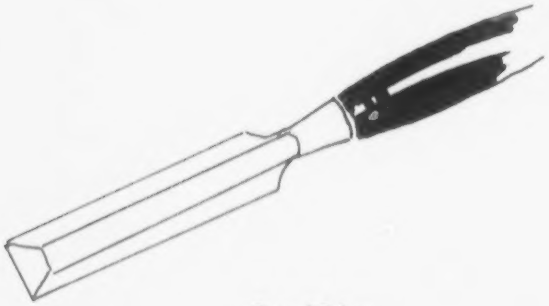
WOOD CHISELS

Wood chisels are classified into two basic groups: framing or finishing. Framing chisels have sturdy blades, shanks and handles and are able to withstand rough usage. The handles of framing chisels are capped with metal so they can be driven with a steel hammer without damage. Finishing chisels are designed to be struck with a wooden mallet or pushed by hand pressure only.

The blades of wood chisels may be straight-edged or bevelled. The bevel-edge blade is useful for working in tight places.



Straight Edge



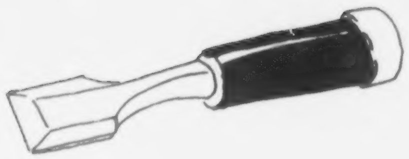
Bevel Edge

Wood chisels are available in blade widths from 3 mm to 50 mm in increments of 3 mm.

Finishing chisels are classified according to the different proportions of their blades.

BUTT CHISELS

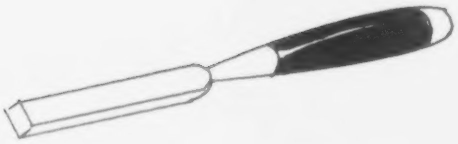
Butt chisels are so named because they have short blades. The blade is about 65 mm to 75 mm in length. Butt chisels are designed for heavy cutting and for use in cramped places.



Butt Chisels

FIRMER CHISELS

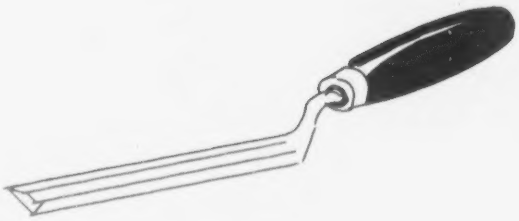
Firmer chisels have blades of approximately 100 mm to 125 mm in length. The blades are relatively thick and are usually the straight edge type



Firmer Chisels

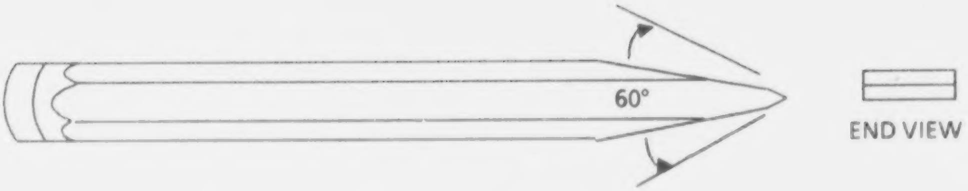
PARING CHISELS

Hand pressure is the only force that can be applied to paring chisels. They have long, thin blades 175 mm to 800 mm in length. Their edges are generally bevelled and their shanks long and thin. Paring chisels are usually used to smooth surfaces inaccessible with other hand tools.



Paring Chisels

FLAT COLD CHISELS



The flat chisel is used for most general cutting and chipping work. The cutting edge is bevelled (tapered) from both sides toward the centre. Normally, the angle of the bevel should be between 60° and 70°. However, for soft metals the angle should be reduced, and for very hard metals the angle should be increased.

SAFE-USE PRACTICES

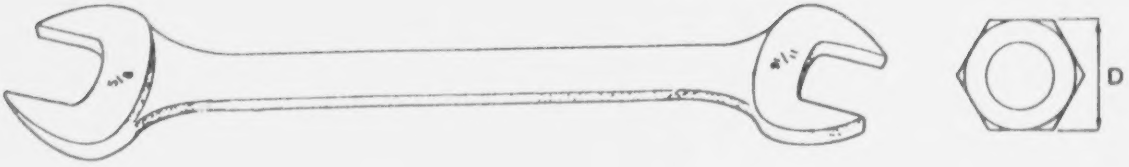
1. The chisel must be big enough for the job, and the mallet used must be big enough for the chisel. Use a mallet not a hammer.
2. Hold the chisel close to its upper end. If the mallet misses, then your hand won't get the full force of the blow.
3. Whenever possible, hold the chisel with thumb and forefinger, palm up, keeping knuckles out of range.
4. Use no more force than is necessary for making the cut, always chip in a direction away from yourself.
5. The cutting edge of chisels must be kept sharp. Chisels with mushroomed heads are dangerous because of the possibility of flying chips. Heads should be dressed as soon as they start to crack. When using chisels for chipping, always wear eye protection. The eyes of people working close by should also be protected, either by goggles or by erecting screen or shield.
7. Never use a chisel without a handle.
8. Wear safety glasses or goggles when using a chisel.

WRENCHES

Wrenches are one of the more commonly used tools in a worker's toolbox. Basic wrench types include:

- open-end wrenches
- box-end wrenches
- combination wrenches
- adjustable wrenches

OPEN-END WRENCHES

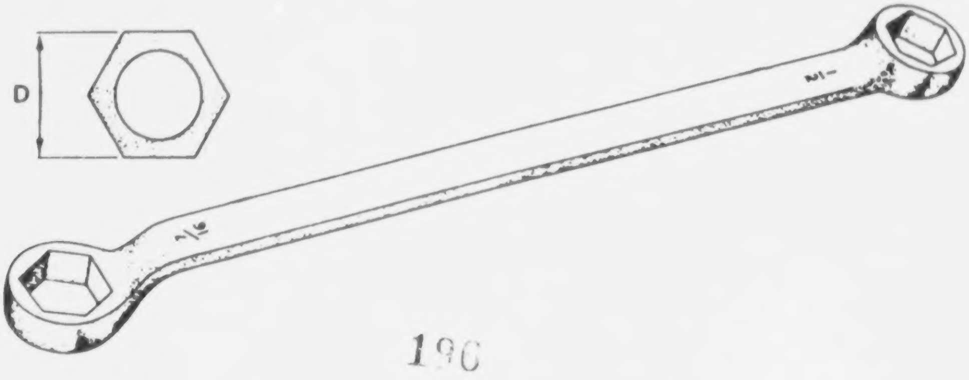


The open-end wrench is one of the most commonly used wrenches in the tool box. It is solid, non-adjustable and is usually made of chrome steel for strength. The sizes of the wrench are usually stamped on the wrench on or near the corresponding head. The size of the wrench does not refer to the diameter, but refers to the distance across the flats of the nut or bolthead.

BOX-END WRENCHES

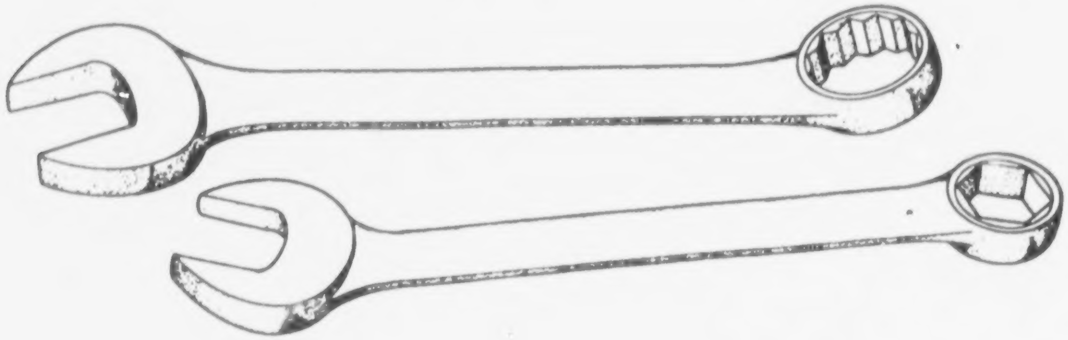
The box-end wrench is an excellent tool for tightening and loosening nuts and bolts. Unlike the open-end wrench, the box-end wrench is made to grip the nut or bolthead on all sides. This prevents slipping and allows greater leverage.

The opening for the nut or bolthead on the box-end wrench differs from that of the open-end wrench in that it is closed. This closed fitting or points around the inner circumference of the opening serve to grip the bolthead or nut more securely.



COMBINATION WRENCHES

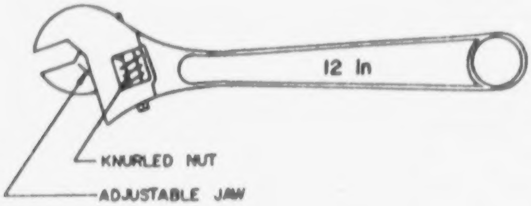
As the name implies, the combination wrench is an open-end wrench and a box-end wrench combined into one tool. Basically these wrenches are designed to turn bolts and/or nuts.



Combination Wrenches

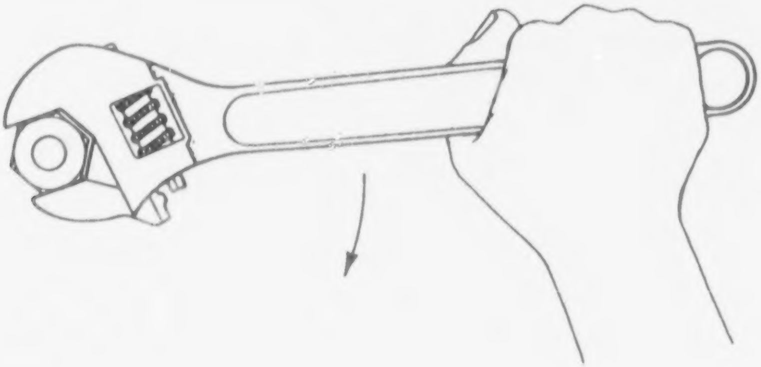
All the features of open-end and box-end wrenches apply also to a combination wrench. It is a very convenient tool. It has the speed of the open-end wrench for running a nut or bolt down snug and the strength of the box-end wrench for completely tightening a nut or bolt. Combination wrenches are available with offset heads, 6- or 12-point heads and in a wide selection of sizes and lengths.

ADJUSTABLE WRENCHES



Combination Wrenches

The adjustable wrench is very similar to the open-end wrench except that it has the provision for adjusting the opening to suit the nut or bolt being turned. The adjustable jaw is moved by a knurled nut which has a locking mechanism on some models. The size of all adjustable wrenches is designated by the wrench length, which varies from 10 cm to 60 cm.

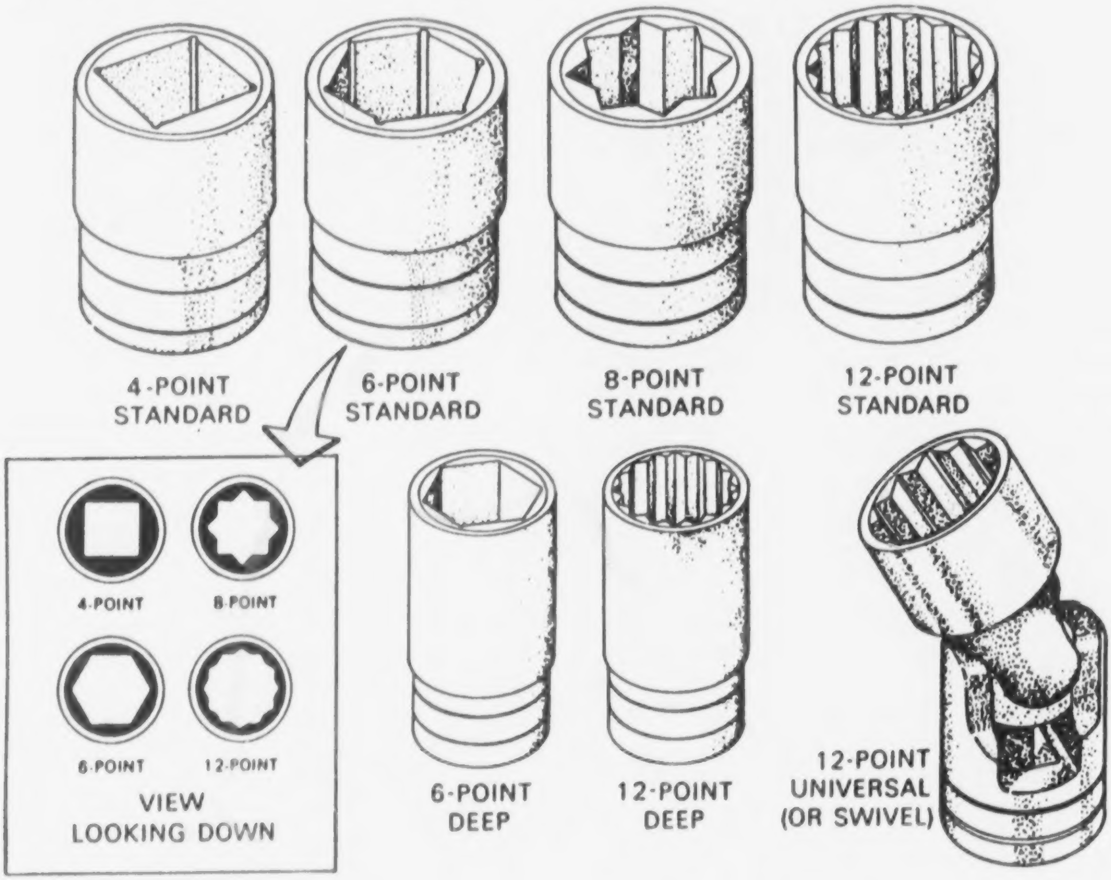


Handling an Adjustable Wrench

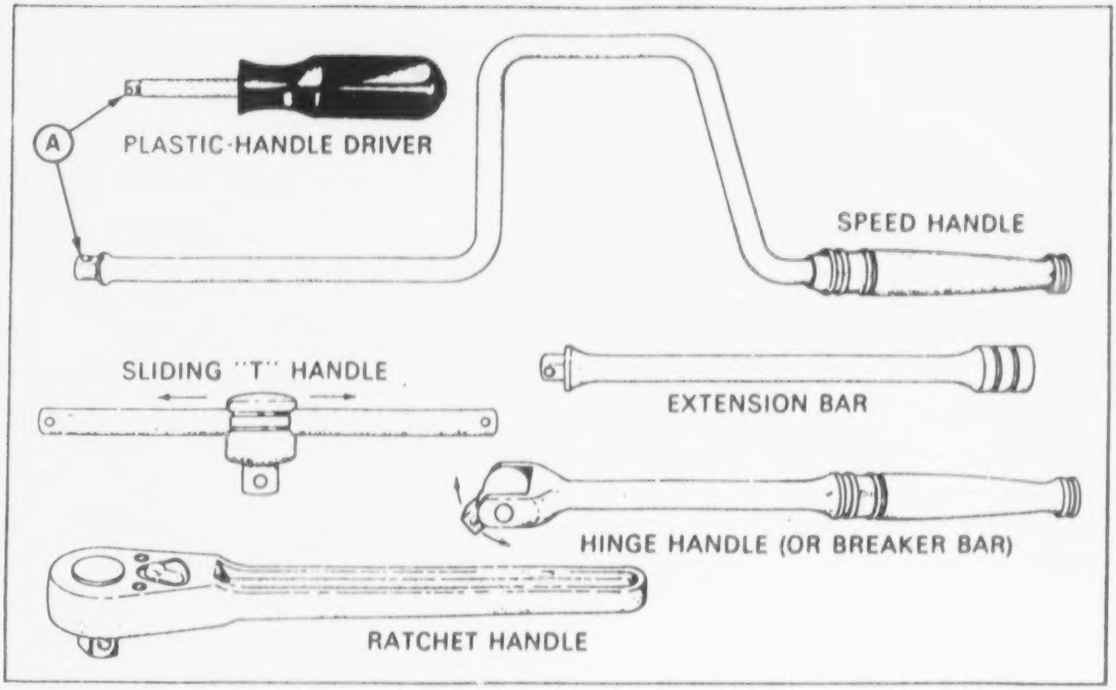
Adjustable wrenches should not be used as a substitute for an open-end or box-end wrench. Adjustable wrenches can be pulled in either direction for light loads, but they develop their greatest strength when pressure is applied to the side of the wrench with the fixed jaw. Always be sure the wrench is adjusted as tightly as possible against the nut or bolthead before attempting to turn it.

The most basic sockets used in industry today are pictured below. They are designed to be used for turning both square and hexagonal fasteners.

Socket Wrenches


4-POINT STANDARD
6-POINT STANDARD
8-POINT STANDARD
12-POINT STANDARD
4-POINT
8-POINT
6-POINT
12-POINT
VIEW LOOKING DOWN
6-POINT DEEP
12-POINT DEEP
12-POINT UNIVERSAL (OR SWIVEL)

In addition to being used for applications similar to other wrenches, socket wrenches have a much wider application. They can reach into recesses that other wrenches cannot. For speed in removals and installations, they are unmatched.


A
PLASTIC-HANDLE DRIVER
SPEED HANDLE
SLIDING "T" HANDLE
EXTENSION BAR
HINGE HANDLE (OR BREAKER BAR)
RATCHET HANDLE

SAFE-USE PRACTICES

1. Use the correct type and size of wrench for the job to be done.

2. Inspect wrenches frequently for worn or sprung jaws, broken cages, sprung faces or bent handles. Repair or replace damaged wrenches at once.

3. It is much safer to pull on a wrench with arm muscles than to push the wrench. The fixed jaw is stronger than the movable jaw, so the pulling force should be directed against the fixed jaw. When pulling on a wrench, brace against a backward fall by placing one foot behind the other.

4. Do not try to work with a wrench in a cocked position. Use angle connections so that wrench will fit flat and square on the nut or bolt head.

5. Never use a wrench as a hammer.

6. Don't pound on any wrench to loosen a frozen nut. Use penetrating oil, a larger wrench, or one designed for impact work.

7. Never apply a wrench to moving machinery.

8. Maintain pipe wrench jaws are sharp and clean.

9. Take a proper stance and do not place your hand or body in a position that may cause you to be injured if the tool should slip.

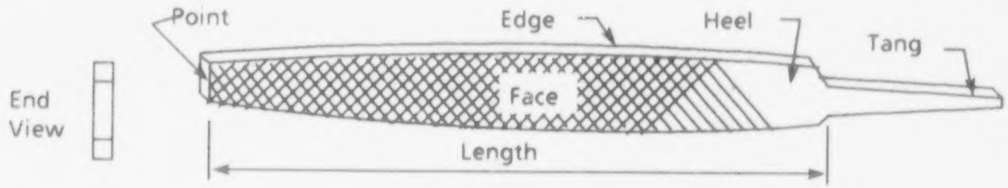
10. Store wrenches in the correct location to prevent damage, loss, or misuse.

INFORMATION SHEET #7

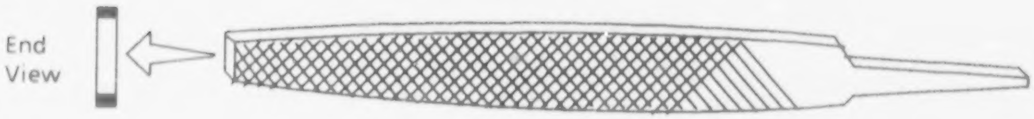
FILES

Of all metalworking hand tools, files are the most widely used. There are more than 3000 different sizes and cuts of files available. Three of the more commonly used files are the:

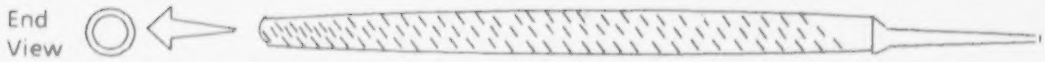
- flat file
- round file
- three-squae file


Point
Edge
Heel
Tang
End View
Face
Length

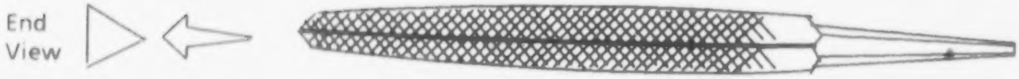
Parts of the File



Flat File



Round File



Three-Square File

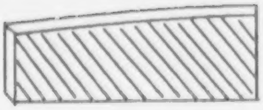
The three-square file, also known as the three-cornered file, is used to clean out corners of a square shape or to file at odd angles. The file is tapered the full length to the point. All faces have teeth, and the corners between the faces are sharp.

CUTTING FACES

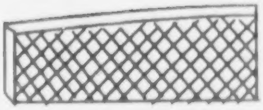
The types of cutting faces can be divided into two different types. First of all they are classed as either single cut or double cut which refers to the actual design of the cutting edges on the file face.

The single-cut file has one unbroken course of teeth running across the face of the file. The double-cut file has two broken courses of teeth crossing each other.

File Faces



Single Cut



Double Cut

For both single and double cut files, the second classification identifies the grade of the file teeth. There are six different grades of file teeth the single or double cut files:

- rough cut
- coarse cut
- bastard cut
- second cut
- smooth cut
- dead-smooth cut

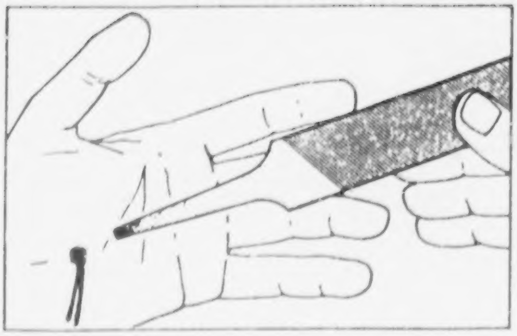
The difference among the grades is the spacing between the teeth. The rough-cut file has the greatest space between the teeth. As the cut becomes smoother, the spacing decreases. The spacing is in relation to the overall size of the file. For example, a large bastard-cut file has more space between the teeth and larger teeth than a small bastard-cut file has, even though both are bastard-cut files.

The single-cut file is used when a smooth finish is desired. The double-cut file is used for rough, fast metal cutting or where large amounts of material must be filed off.

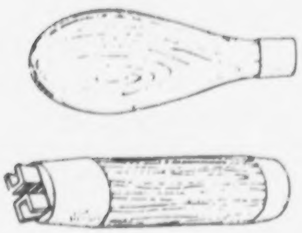
FILE HANDLES

Most files are sold without handles, so the first step in using a file is to fit it with the proper handle. Most always select a handle to properly fit the file – neither too large nor too small for the file tang.

There are two reasons for using a file handle on all files. The first and most important is safety. The tang of a file is usually pointed. If you meet an obstruction while filing and the file stops suddenly, your hand could be severely punctured. Secondly, the handle helps guide the file and the work can be done more accurately and more quickly if a good file handle with a strong ferrule, or metal collar, is used.



The tang of a file can be dangerous if used without a handle.



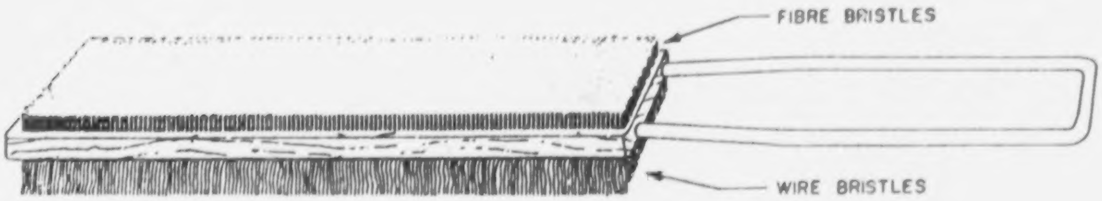
File Handles

CLEANING FILES

Before starting any filing operation, especially the filing of mild steel or soft non-ferrous metals, the file should be coated with chalk. The chalk acts as a dry lubricant which prevents metal cuttings from becoming pinned or trapped in the teeth of the file.

Metal particles trapped in the teeth of a file not only reduce the file's ability to remove metal from the workpiece, but may also cause damage to the surface of the workpiece.

As soon as you notice a build-up of particles on your file, brush them off with a file card. A file card has wire bristles on one side and fibre bristles on the other.



File Card

Begin cleaning the file with the fibre bristles. Then, if necessary, remove any particles still left in the teeth with the wire bristles.

Sometimes after filing soft metals such as aluminum copper and lead, filings will remain stuck between the teeth even after using the file card. If this happens you should use a sharp, pointed piece of hard wood or soft iron to pick the remaining filings from between the teeth.

Never use a piece of hardened steel (such as a pointed punch or chisel) to pick file teeth clean. Damage to the teeth can result.

STORING FILES

More files wear out from abuse than from use. When not in use, files should be kept separated from each other and from other tools to prevent damage to the file teeth.

SAFE-USE PRACTICES

1. Before attempting to use any file, it should be equipped with a tight fitting handle. It is dangerous to use a file without a handle for often the end of the tang is quite sharp. If you are using a file without a handle the pressure of your hand against the end of the tang may result in bad cut.

2. Whenever possible, the part to be filed should be clamped rigidly in a vise. To prevent rough vise jaws from damaging finished surfaces, use copper caps or other soft material.

3. In using a file, remember that the teeth are made to cut in one direction only when the file is being pushed forward. All pressure of the file against the work should be relieved on the back stroke. Holding a file against the work on the back stroke serves only to help dull the cutting edges of the teeth. The preferred method of using a file is to raise it off the work before drawing it back. Files stay sharper longer when used this way.

4. Never use a file for prying. The tang end is soft and bends easily. The body of the file is hard and very brittle. A light bending force will cause it to break.

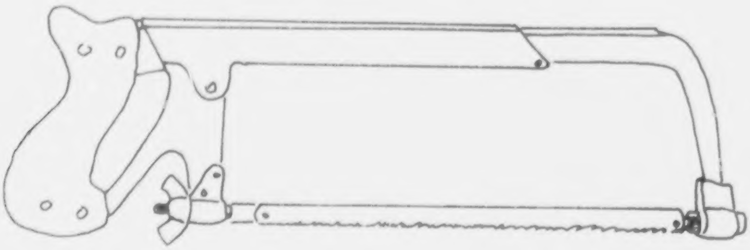
5. Never hammer on a file. This is a dangerous practice as the file may shatter and send chips flying in every direction.

6. Maintain files properly and store them in correct locations.

SAWS

HACKSAWS

Hacksaws are used to cut bolts, screws, metal tubing, rubber hoses and sheet metal. The hacksaw consists of a metal frame, handle and saw blade. The adjustable type accommodates different sizes of blades, from 20 cm to 40 cm. The non-adjustable type holds only the one size of blade it was made for. A good hacksaw has a protective handle to prevent injury in case the blade breaks or your hand slips while you are using the saw.

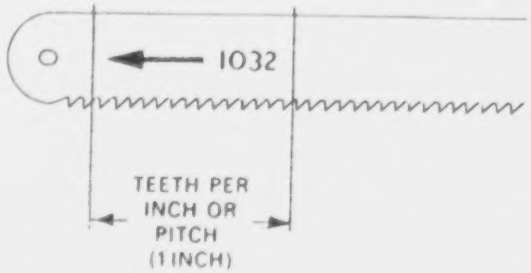


Adjustable Hacksaw

HACKSAW BLADES

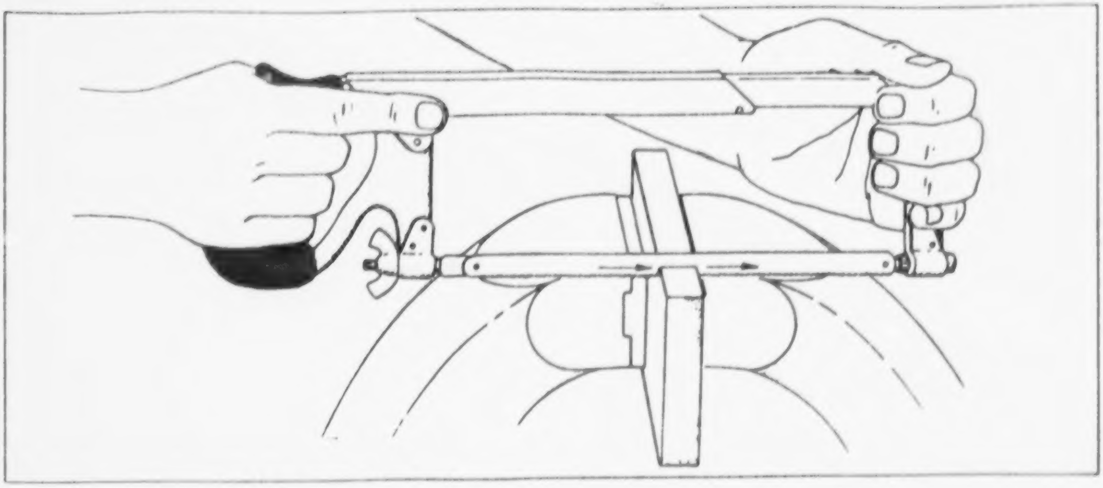
Hacksaw blades are made of hard, tempered steel. The blade may be "all-hard" or flexible. The flexible blade has had only the teeth of the blade hardened, while the all-hard blade has been tempered throughout. Since hacksaw blades have been tempered, they are too hard to be re-sharpened. Once a blade becomes dull, it must be discarded.

The pitch (number of teeth per inch) may be 14, 18, 24 or 32. The part number stamped on each blade is a code number indicating the blade length and number of teeth per inch. For example, Code number 1018 identifies a blade 10" long, with 18 teeth per inch, while code number 1032 per inch, while code number 1032 identifies a 10" blade with 32 teeth per inch.



Code Number

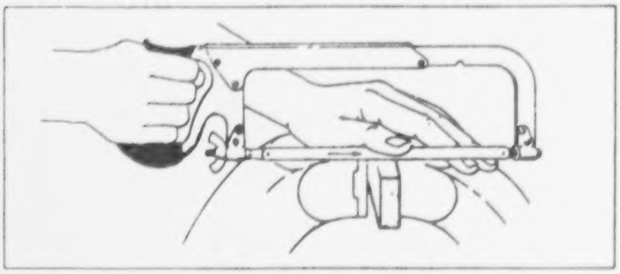
USING A HACKSAW



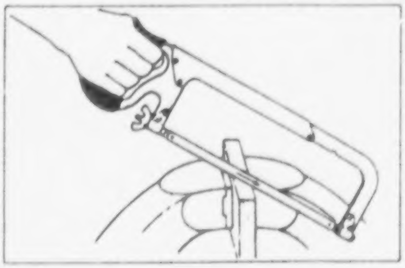
Using a Hacksaw

1. Be sure the material to be cut is held securely in a vise or C-clamp. Secure the work piece low in the vise. If the material shifts while you are attempting a cut, the blade may break or the material may be damaged. Be sure, too, that the blade is held tightly in the hacksaw frame to prevent any wandering of the blade during the cutting stroke.

2. Never start a cut with the piece of material held at a sharp angle. This will break or dull the blade teeth, and also violate the rule of thumb mentioned earlier about at least two teeth contacting the material to be cut at all times.



Correct Starting Angle



Incorrect Starting Angle

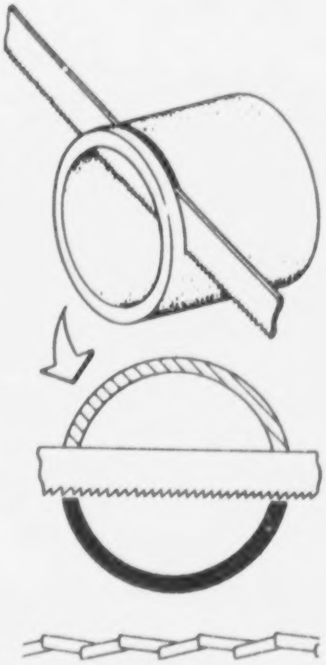
Be sure the hacksaw blade is placed on the pins with the arrow on the blade pointing forward, away from the handle. If the arrow is not visible, ensure that the teeth of the blade face forward as all cutting is done on the forward stroke.

There is no such thing as "an all-purpose" hacksaw blade. The right blade must be chosen for the specific job.

A good rule of thumb to remember in choosing the right blade is that at least two teeth of the blade should be in contact with the material being cut at all times.

To avoid ruining a hacksaw blade, always test the material to be cut first by taking the edge of a file and running it along the area you are going to cut. If the material cannot be filed, it cannot be cut with a hacksaw.

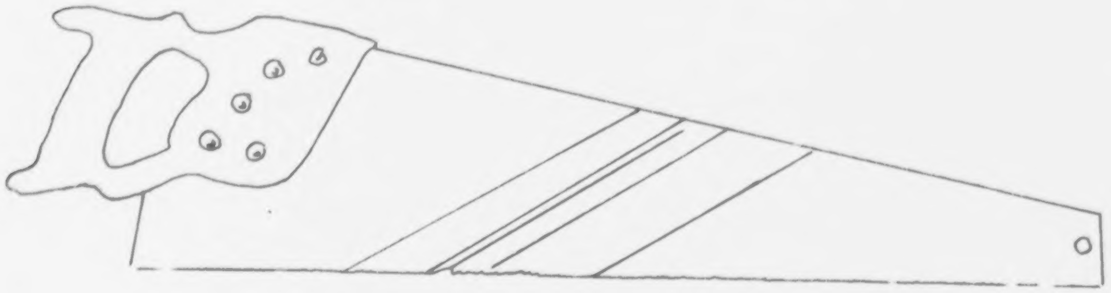
The teeth of a hacksaw blade are alternately set in opposite directions from the sides of the blade, similar to the teeth of a carpenter's saw. This angle is necessary so that the slot cut by the teeth will be slightly wider than the blade, thus providing the clearance necessary to prevent the blade from binding. As the blade wears and the points of the teeth become dull, the teeth straighten slightly and the cut made by the blade becomes narrower. A dull blade has a tendency to stick in the material being cut and breaks easily.



Coarse Tooth Blade

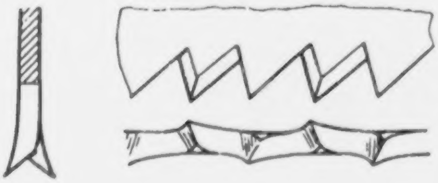
CROSSCUT SAW

The crosscut saw is designed to cut across the grain of wood.



Crosscut Teeth

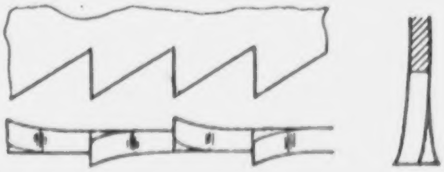
The knife-like teeth sever the wood fibres along each side of the cut. The teeth are set alternately from side to side to cause the width of the cut to be wider than the thickness of the blade. This set of the teeth reduces the friction on the sides of the teeth.



Coarse Tooth Blade

RIP SAWS

Rip saws are used to cut along the length of lumber. Rip saws are similar in appearance to crosscut saws but their teeth are shaped differently. Their chisel-like shape removes tiny shavings of wood on forward strokes.

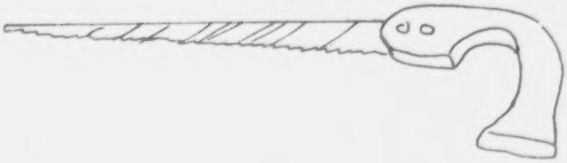


Rip Saw Teeth

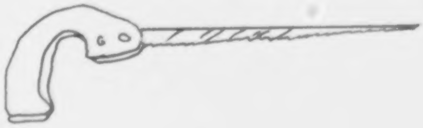
COMPASS OR KEYHOLD SAWS

Compass and keyhole saws are used to cut along a curved path. The keyhole saw is smaller than the compass saw, and can cut curves of a smaller radius. Their teeth are filed so they will cut either along the grain or across the grain of lumber.

Long gradual curves can be cut using full length strokes but small radius curves require that only the narrow portion of the blade is used.



Compass Saw

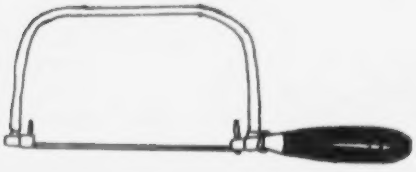


Keyhole Saw

COPING SAWS

Coping saws are used to cut curves with a very small radius.

The blade may be installed to cut on the push stroke or on the pull stroke. Blades of various widths and teeth sizes are available. The blade can be rotated 360° within the frame. The tension of the blade is adjusted by tightening or loosening the handle.



Coping Saw

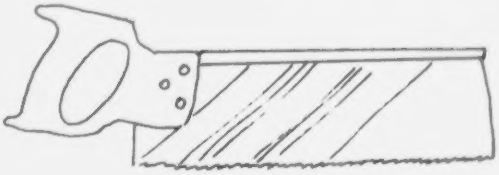
The general rules for selecting coping saw blades are:

1. Intricate curves require narrow blades.
2. Thin stock requires small, closely spaced teeth.

BACK SAWS

Back saws are short, small-toothed crosscut saws. The thin blade is stiffened by a rigid frame along the top edge of the blade.

Back saws are used to cut mouldings and other small stock to length.



Back Saw

Whenever you are cutting material with any type of hand saw you should start the cut with a reverse-stroke rather than a forward-stroke. Doing so lessens the chance of the saw jumping off the mark. Once a groove is formed, the saw can be moved back and forth to make the cut.

For an accurate cut the full width of the saw cut must be on the waste side of the layout line.

By placing your shoulder, elbow and forearm in line with the saw you will find you are able to guide the saw along its path without binding or jamming.

GENERAL CARE AND MAINTENANCE OF HAND TOOLS

Looking after hand tools should be a matter of common practice.

- Tools that can rust should be kept dry. Tools which have been exposed to moisture should be dried and lightly oiled before being put away, to avoid rusting.
- The sharp edges of cutting tools should be protected before storage.
- Fragile tools should be handled with care.
- Wood chisels should be stored in individual spaces to protect their cutting edges.
- Hand tools which have moving parts should be lubricated at points of wear (e.g., the screw on a "C" clamp).
- Glue, pitch and any other foreign matter should be removed from the face of hammers.
- Wooden handles on hand tools should be tightened at the first sign of looseness.
- Tape measures should be wiped clean and lubricated with paste wax or silicone.

If you take proper care of hand tools you will find that the quality of their performance stays constant. Regular maintenance and care of tools will increase safety in the workplace for you and for others around you.

EVALUATION SHEET
USING BASIC HANDTOOLS

Student's Name ______________________ Date ____________________

Course ______________________

Mark __________

Items to be Evaluated	Mark	Mark Attained
1. Identifies basic hand tools	3	
2. Uses a hammer and mallet correctly	3	
3. Uses pliers correctly	3	
4. Uses a punch correctly	3	
5. Uses a chisel correctly	3	
6. Uses a screwdriver correctly	3	
7. Uses a wrench correctly	3	
8. Uses a file correctly	3	
9. Uses a saw correctly	3	
*10. Returns tools to correct storage area	4	
*11. Cleans work area to shop standards	4	
*12. Follows all safety procedures	5	
*These items must be completed to 100% accuracy.		
Total	40	

Comments ____

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Teacher's Signature ____________________ Student's Signature ____________________

MEASURING AND LAYOUT TOOLS

The ability to measure, to use measuring tools, and to apply measurements in order to perform a task are necessary skills in almost all occupations. In Canada, the major system of measurement is the metric system. However, certain industries, for example, the building and construction industry and the food preparation industry, may use both the metric and imperial systems of measurement.

Information and job sheets in this handbook use only the metric system of measurement. Where necessary, the teacher will provide information concerning the imperial or U.S. systems of measurement.

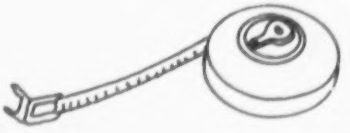
"Layout" refers to the application of measurements to perform a task, e.g., measuring and marking a piece of wood or metal before cutting it to a required size. The following tools are commonly used both for measuring and for laying out measurements.

MEASURING DEVICES

The selection of which type of measuring device to use is usually dictated by the length of the measurement to be taken and by the accuracy required.

LONG STEEL METRIC TAPES

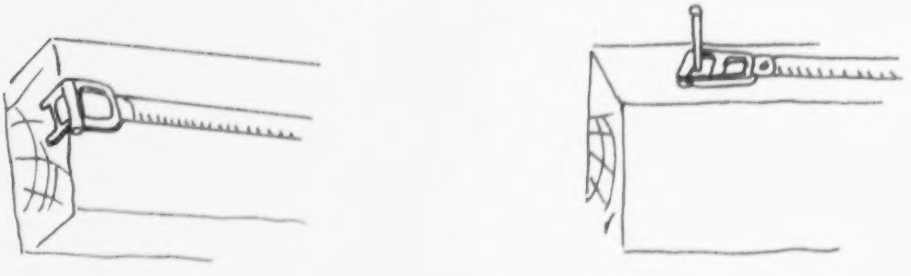
Long flexible steel tapes are wound inside a convenient carrying case. Lengths range from 15 m to 60 m. These tapes are usually marked with graduations each of two millimetres.



Long Steel Tape

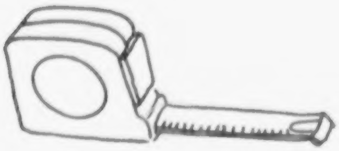
The zero end of the tape has a hook or a D-ring or a combined hook and D-ring.

To take a measurement, attach the end of the tape to the stock and then pull the tape from its case until enough is exposed to read the measurement in question. Return the tape to its case by rotating the crank.



Attaching Long Steel Tape to Stock

A shorter, spring-loaded steel tape ranging in length from 2 m to 7.5 m is carried in the tool pouch or pocket of most construction workers. The pocket tape is equipped with a small hook at the zero end of the tape. The hook should slide an amount equal to its own thickness to permit accurate internal and external measuring. Graduations are at one millimetre intervals.

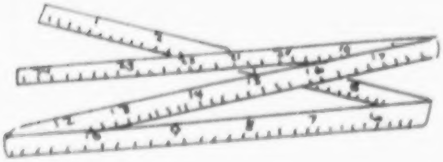


Pocket Tape

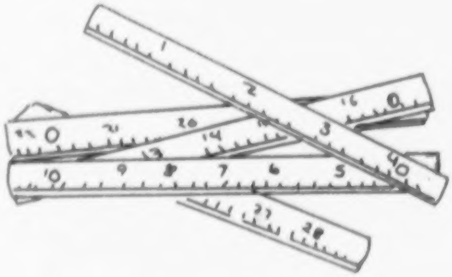
The pocket tape is easy to use, long enough for most occasions yet convenient to carry. Pocket tapes range in width from 12 mm, 19 mm to 25 mm. Wide blades are more rigid than narrow blades when extended; however, narrow blades are easier to carry in your pocket.

FOLDING RULES

There are two basic types of folding rules, hinged and spring-jointed.



Hinged Rules



Spring-Jointed Rules

Both types may be made of wood, plastic or metal. When folded, they are approximately 150 mm to 200 mm in length and are easily carried in a pocket.

When extended, the folding rule provides a rigid ruler that can span distances without sagging. This rigidity can provide greater accuracy than a narrow steel tape. Graduations are in one millimetre increments.

Layout tools may be used both to measure and to apply measurements to stock (e.g., wood, metal, plastic stock). Commonly used layout tools include squares, framing squares, try squares, combination squares, spirit level, plumb bob, scribers and chalklines.

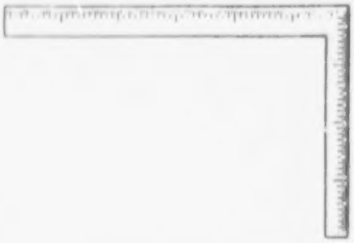
SQUARES

To ensure that layout lines and cuts are straight and square, workers may use a variety of squares. The three predominantly used at the framing square, the try square and the combination square.

For the best results with a square, you should ensure that the size of the square matches the size of the workpiece being laid out or checked for squareness.

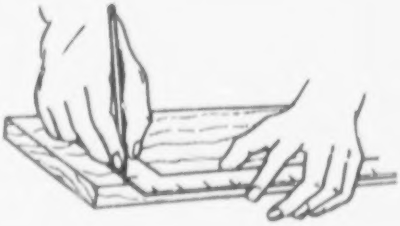
FRAMING SQUARE

Framing squares measure 600 mm on their long side and 400 mm on their short side.



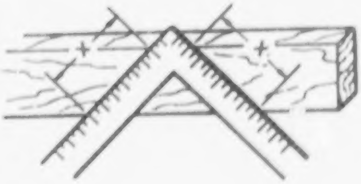
Framing Square

To mark a layout line at 90° to the edge of a board, simply hook the long side over the edge of the board, and mark the face of the board along the short edge of the square.



Layout for a square

Various angles can be laid out with a framing square; for example, a 45° angle can be accurately laid out if you place the framing square so that the edge of a board intersects the sides of the framing square at an equal measurement along each side of the square.



Laying Out 45°

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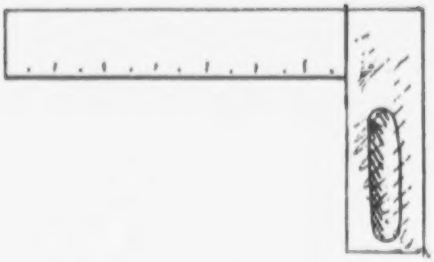
TRY SQUARES

Try squares are used to lay out or check 90° cuts on work pieces. The handles of some try squares are sloped at 45° permitting you to lay out 45° angles. These are called try and metre squares.

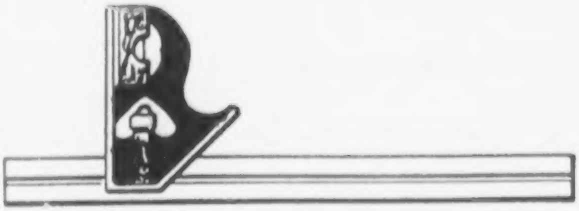
Try squares are generally used on smaller work pieces as their handle length is only 100 mm to 200 mm long. Blade lengths range from 150 mm to 250 mm.



Try Square

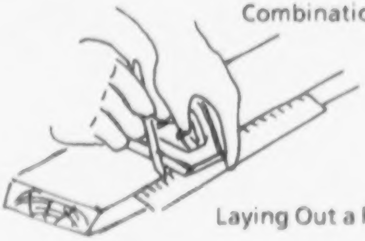
COMBINATION SQUARE

The combination square is equipped with an adjustable head which can be fixed at any point along its 300 mm steel rule. This head has one edge at 90° to the blade and another edge at 45° to the blade.



Combination Square

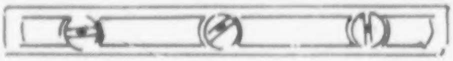
By fixing the head at a desired distance from the end of the rule, you can use the combination square to lay out a line parallel to the edge of a work piece.



Laying Out a Parallel Line

SPIRIT LEVEL

Spirit levels are used to lay out and test level surfaces. A level surface is one which is horizontal or parallel to the surface of still water. A plumb line or surface is at 90° to level.

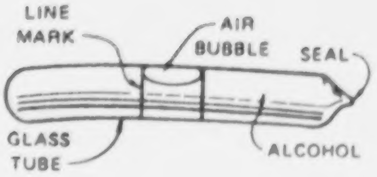


Spirit Level

If the spirit level is equipped with glass tubes perpendicular to its length, it can also be used to establish plumb layouts.

The glass tubes contain alcohol (spirits) and an air bubble. The glass tube has a slight upward curve at the midpoint of its length. When the glass tube is in a level position the air bubble will be centred between two lines on the tube.

Spirit levels are available in a variety of lengths. One of the more popular lengths is the 800 mm.

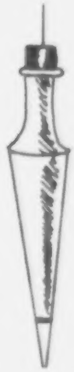


Level Indicator

PLUMB BOB

A plumb bob is a weight that comes to a centred point at its bottom end. When the plumb bob is suspended from a string, the string will be plumb. The point is in line with the string and can, therefore, be used to locate a point directly below the centre of the string.

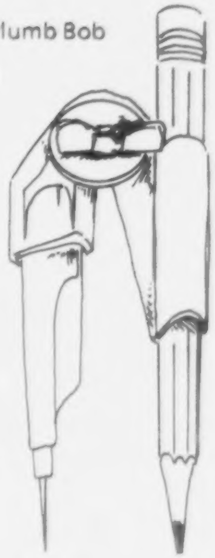
If the point is not required, any weight can be suspended by a line and that line will be plumb.



Plumb Bob

SCRIBERS

A scriber is used to lay out a line parallel to an irregular surface. It is often used to fit the edge of a plank to an uneven surface such as a stone wall. For this, you would first secure the plank near its desired location. Then set the scriber to the widest gap between the two surfaces. Using the scriber point, follow along the uneven surface of the stone wall while the pencil point contacts the face of the plank. By holding the scriber points level throughout the drawing operation, you will describe a line on the face of the plank that is exactly the same as the stone wall's surface.



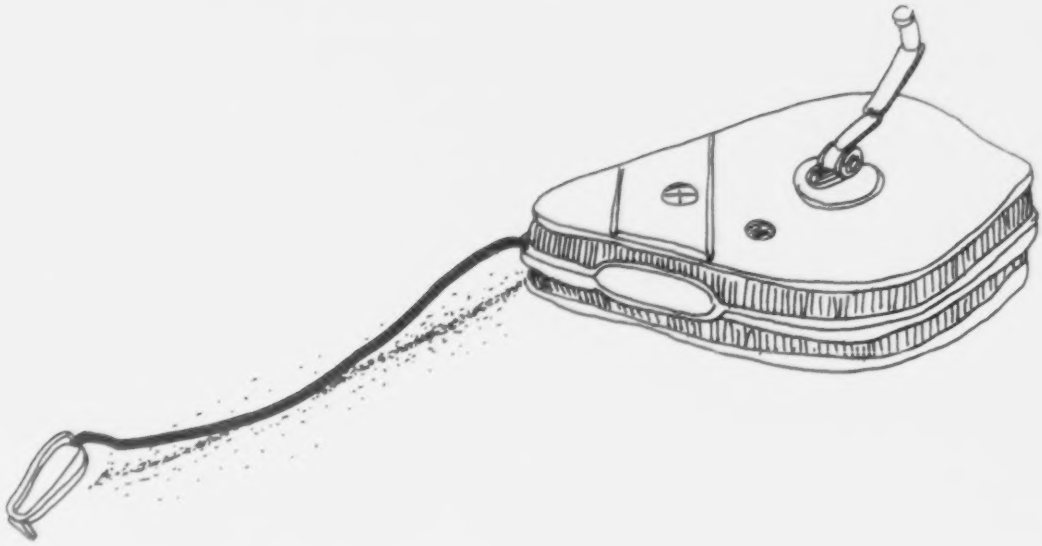
Scriber

CHALKLINE

Chalklines are strings which are embedded with chalk powder. The chalkline is used to lay out a straight line between two points.

The line is stretched tightly between two points on a surface, then raised above the surface at its centre and then allowed to snap back. The snapping action deposits a straight line of chalk on the surface.

Chalkline



EVALUATION SHEET
USING MEASURING AND LAYOUT TOOLS

Student's Name ______________ Date ______________

Course ______________

Mark ______________

Items to be Evaluated	Mark	Mark Attained
1. Understands the purpose of taking correct measurements	3	
2. Identifies measuring devices	3	
3. Uses tape measures correctly	3	
4. Uses a square correctly	3	
5. Uses a spirit level correctly	3	
6. Uses a plumb bob correctly	3	
7. Uses a scriber correctly	3	
8. Uses a chalkline correctly	3	
*9. Returns tools to correct storage area	3	
*10. Cleans work area to shop standards	3	
*11. Follows all safety procedures	5	
*These items must be completed to 100% accuracy.		
Total	35	

Comments ______________

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Teacher's Signature ______________ Student's Signature ______________

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JOB SHEETS

The purpose of a job sheet is to provide opportunities to practice practical skills. The following job sheets are samples of practical tasks that require the ability to use a combination of basic hand tools. Teachers are encouraged to develop other job sheets to achieve the similar purpose with other hand tools.

STUDENT ACTIVITY

1. You may wish to design your own job sheet. The procedure to follow may include:
   - obtain teacher approval for your project idea
   - sketch out the project
   - identify the materials and tools needed to produce the product
   - check-out necessary tools from their storage area
   - layout the project, consult with teachers, peers and others
   - produce the project
   - ask teacher to evaluate the finished product.
2. Ask yourself and others the following questions:
   - Can the product be used by others?
   - Is it possible to manufacture them easily and relatively cheaply?
   - If you and possibly a friend can make them, can you sell them to other people in school or in the community?
   - Would you like to be an entrepreneur? Why?

JOB SHEET #1

A BENCH HOOK

REQUIREMENTS

Tools

- rule or tape measure
- pencil
- try square
- back saw
- smoothing plane
- brace and 8 mm (3/8") bit
- 15 mm (5/8") bit
- bench hook
- hammer
- two small clamps

MATERIALS

Lumber

1 pc. 19 mm x 38 mm (1 x 2), 400 mm long

1 pc. 19 mm x 184 mm (1 x 8), 325 mm long

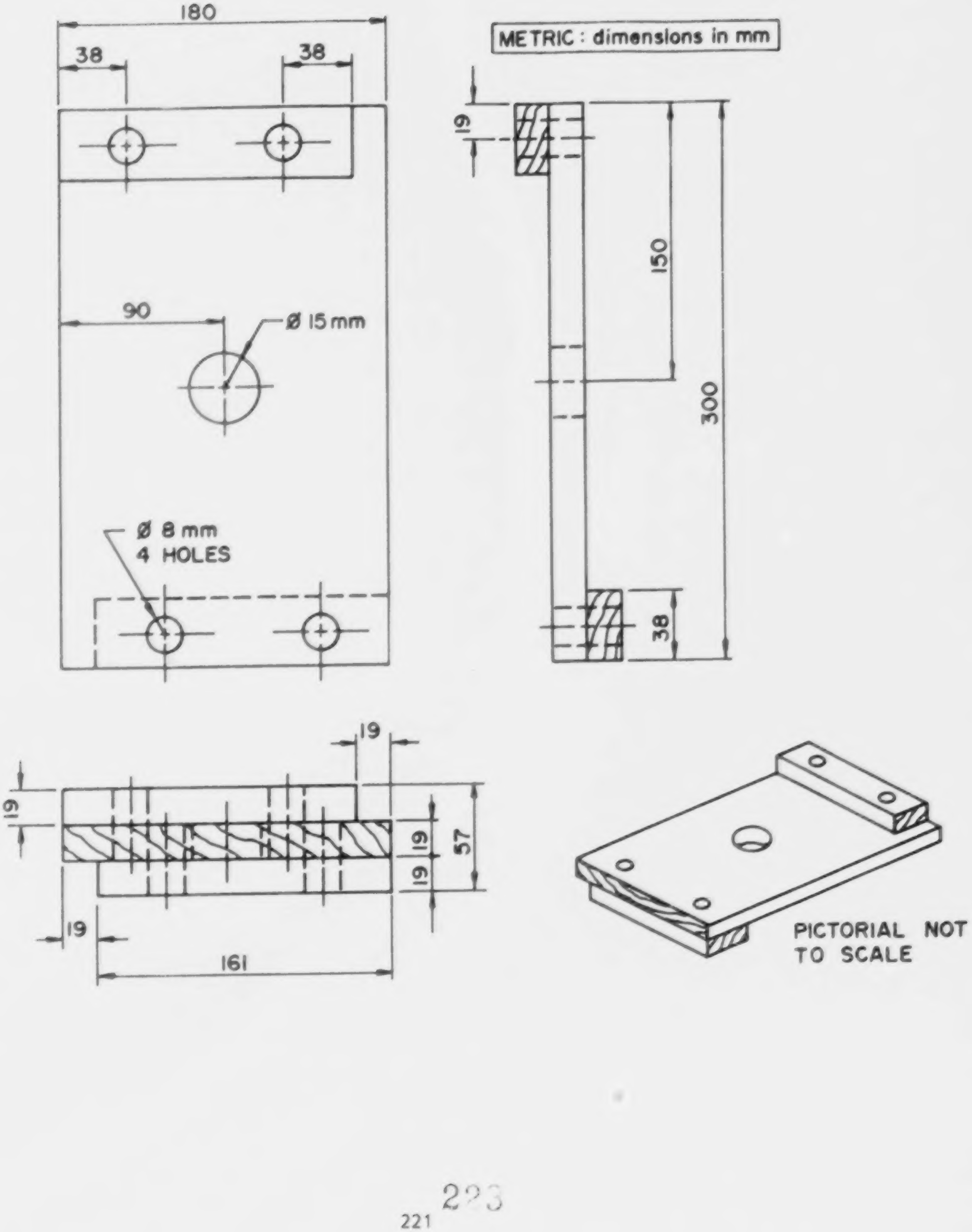
4 pc. 8 mm (3/8") dowel, 50 mm long.

Glue

White glue

DESIGN AND LAYOUT

BENCH HOOK


180
38
38
90
Ø 15mm
Ø 8 mm
4 HOLES
19
150
300
38
19
19
19
57
19
19
161

METRIC : dimensions in mm

PICTORIAL NOT
TO SCALE

PROCEDURE

1. Make sure you adhere to all shop safety rules and follow all the safety precautions for using the hand tools as you work through this project.

2. Study the drawing to visualize what the finished project will look like.

3. Gather the listed tools and materials.

4. Use the try square and pencil to lay out square cuts on the ends of the 19 mm x 180 mm stock. The layout lines should be 300 mm apart.

5. Use a saw and bench hook to cut the stock to length. Make sure the saw cut is on the waste side of the line and that the pencil line is visible after the cut.

6. Lay out and saw the two end-stops to a length of 161 mm. The end-stops are 19 mm less than the width of the bench hook. Cut these pieces exactly to length.

7. Lay out the locations of the dowels on each end-stop.

8. Apply a thin layer of glue to the side opposite the dowel layout and place one stop so that its edge is on the pencil line along the end of the 180 mm wide stock. The end of the end-stop should be 19 mm from the edge of the bench hook.

9. Clamp the end-stop to the bench hook. The clamp should be located near the centre of the end-stop to permit room to drill the two holes for the dowels.

10. Use the brace and an 8 mm bit to drill through the end-stop and the bench hook at the two locations shown on the drawing.

    As you drill into the bench hook, feel for the tip of the drill bit as it just begins to penetrate through the wood.

    As soon as you can feel the drill point coming through, stop drilling. Back the drill out of its hole and complete the drilling from the other side.

11. Sharpen the end of the dowels slightly with a pencil sharpener or dowel sharpener, apply a little glue to the inside surface of the holes and drive the dowels completely through the bored holes. You will trim the ends of each dowel flush to the surface after the glue has set; however, you should wipe off any excess glue before it sets.

12. Repeat steps 8 to 11 at the other end of the bench hook, making sure the end-stop is on the opposite side of the bench hook and its end is 19 mm from the opposite edge of the bench hook.

13. When the glue has set, use a saw to cut off the protruding ends of the dowels. Hold the side of the saw flat to the surface of the bench hook as you saw the dowels. Position the saw so the saw strokes are in the same direction as the woodgrain. Cross grain strokes will scratch the surface of the wood.

14. Plane the ends of the dowels flush to the surface of the bench hook.

15. Sand paper the ends of the bench hook until they are flush to the edges of the end-stops.

16. Bore a 15 mm hole in the centre of the bench hook. Remember to drill from both sides to avoid splintering the surface of the stock.

17. Return the tools and clean up your work area.

18. Present your bench hook to your teacher for evaluation.

EVALUATION SHEET
CONSTRUCTING A BENCH HOOK

Student's Name ____________________ Date ____________________

Course ____________________

Mark __________

Items to be Evaluated	Mark	Mark Attained
1. Length is 300 mm (+ or – 2.0 mm)	3	
2. Width is 180 mm (+ or – 2.0 mm)	3	
3. Ends are square	3	
4. Dowels are in correct location	3	
5. Dowel ends are flush and smooth	3	
6. All excess glue has been removed	3	
7. Stops are positioned left and right	3	
8. All holes bored without breakthrough	3	
9. Stops are 19 mm from side (+ or – 0.5 mm)	3	
10. All surfaces smooth and clean	3	
11. Stops are on opposite sides of bench hook	3	
*12. Work area cleaned to shop standards	5	
*13. All tools returned to storage	5	
*14. All safety procedures followed.	7	
*These items must be completed to 100% accuracy.		
Total	50	

Comments ____________________

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Teacher's Signature ____________________ Student's Signature ____________________

JOB SHEET #2

BOOKENDS

REQUIREMENTS

Tools

- rule or tape measure
- pencil
- combination square
- back saw
- bench hook
- smoothing plane
- brace and 8 mm bit
- hammer
- nail set

MATERIALS

Lumber

1 pc. 19 mm x 140 mm, 800 mm long

4 pc. 8 mm dowel, 50 mm long.

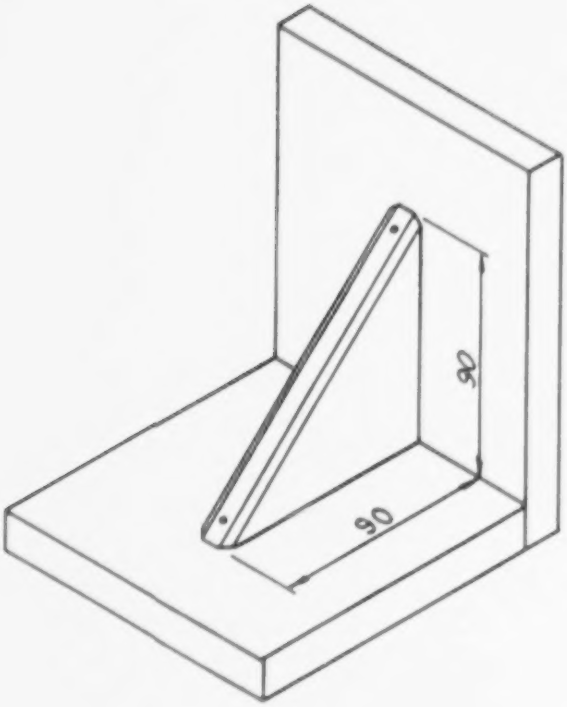
Glue and Nails

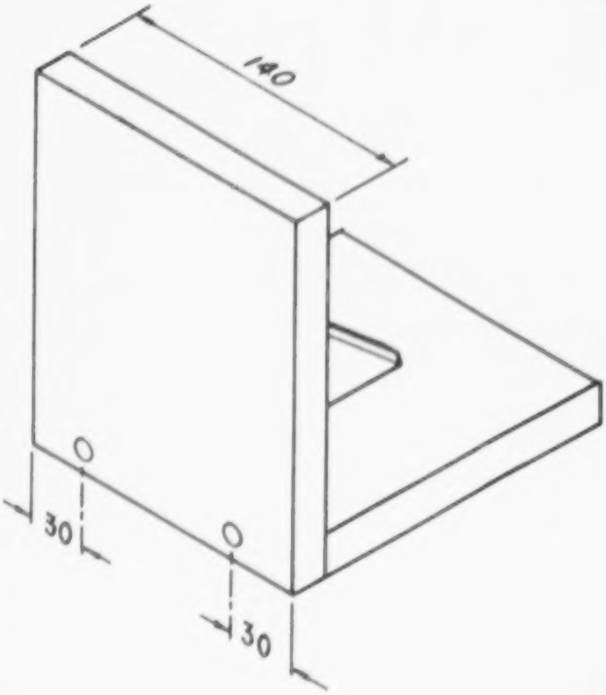
White glue

32 mm finishing nails

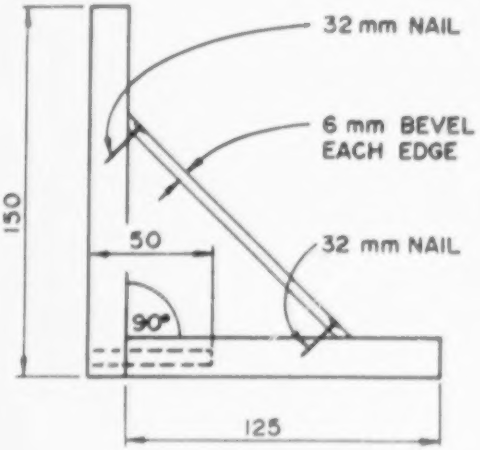
DESIGN AND LAYOUT

BOOKENDS





METRIC : demensions in mm


32 mm NAIL
6 mm BEVEL
EACH EDGE
32 mm NAIL
150
50
90°
125

PROCEDURE

1. Make sure you adhere to all shop safety rules and follow all the safety precautions for using the hand tools as you work through this project.

2. Study the drawings to visualize what the finished project will look like.

3. Gather the tools and materials listed above.

4. Use the combination square and pencil to lay out a square cut approximately 10 mm from one end of the lumber.

5. Place the lumber on the bench hook and cut along the line with a saw.

6. Measure, lay out and cut 2 pieces – 125 mm long and 2 piece – 150 mm long.

7. Use the combination square to check that all ends are square. Plane those ends which are not. Plane the ends from the sides to just past the centre. Do not use full length strokes as the plane will chip the far edge of the stock.

8. Test how the end of the 125 mm pieces fit to the sides of the 150 mm pieces when held at 90° to each other. When you get a tight fit, proceed with step 9.

9. Secure one of the short pieces in a wood vise and apply a thin layer of glue to its end. Place a long piece as shown in the drawing and nail it to the short piece with three 32 mm finishing nails.

10. Use the nail set to set the nails 2 or 3 mm below the surface.

11. Remove any excess glue before it dries.

12. Using the brace and 8 mm bit, drill two holes as illustrated in the drawing. The holes should be approximately 50 mm deep. The holes should be 30 mm from the edge of the bookend.

13. Place each dowel in the wood vise and cut a shallow groove along its length with the back saw to allow excess glue to escape.

14. Form a slight taper on one end of each dowel with a pencil or dowel sharpener.

15. Apply a thin layer of glue to the sides of the holes and gently hammer the dowels into the holes. Any excess glue should squeeze out along the groove cut in the dowel. If you hammer the dowel in too quickly, the pressure of the excess glue could split the wood.

    Any portion of the dowel projecting above the surface can be cut off with the back saw later.

16. Wipe off any excess glue.

17. Repeat steps 11 through 18 for the other bookend.

18. When the glue has set, use a saw to cut off the protruding ends of the dowels. Hold the side of the back saw flat to the surface of the bookend as you saw off the dowels. Position the saw so the saw stroke travels in the same direction as the wood grain. Cross grain strokes will leave scratches in the wood.

19. Lay out and cut two angle braces as shown in the drawing.

20. Plane each cut to ensure a tight fit to the book ends.

21. Plane a bevel on both long edges of each angle brace.

22. Lay out the location of the angle braces centred on the width of the bookends.

23. Apply a thin layer of glue to the angle braces and secure them to the bookends with 32mm finishing nails.

24. Set the nails and remove any excess glue.

25. Plane the ends of the dowels flush to the surface of the bookends. Plane the end of the longer pieces flush to the face of the shorter pieces. Plane the edges of the bookends flush.

26. Return the tools to storage and clean up your work area.

27. Present your bookends to your instructor for evaluation.

EVALUATION SHEET
CONSTRUCTING BOOKENDS

Student's Name ______________________ Date ____________________

Course ____________________________

Mark __________

Items to be Evaluated	Mark	Mark Attained
1. Bookends are 150 mm high (+ or – 2.0 mm)	3	
2. Bookends are 144 mm long (+ or – 2.0 mm)	3	
3. All surfaces mooth	3	
4. All ends square	3	
5. Dowel ends are flush and smooth	3	
6. All excess glue has been removed	3	
7. Angle braces have bevelled edges	3	
8. All joints tight-fitting	3	
9. Bottoms of bookends flush and smooth	3	
10. Edges of bookends flush	3	
11. End grain not broken	3	
12. Bookends form 90° angle	3	
13. Angle brace centred	3	
*14. Work area cleaned to shop standards	3	
*15. All tools returned to storage	3	
*16. All safety precautions followed	5	
*These items must be completed to 100% accuracy.		
Total	50	

Comments ____

____

Teacher's Signature ____________________ Student's Signature ____________________

PORTABLE POWER TOOLS

The ability to correctly use portable power tools enhances employability. In another words, prospective employers in many trades look for workers who can safely operate a number of basic power tools as well as basic hand tools.

Power tools assist workers to perform certain tasks with greater speed and greater accuracy. The following information sheets focus on three commonly used portable power tools:

- power saws
- power drills
- power grinders

Additional power tools will probably be available in your school and in the workplaces you will visit.

Before using any tool, especially power tools it is important to know:

- What the safety precautions to take before, during and after using a power tool.
- How the tool is used.
- When the tool should be used.
- Who should use the tool.
- Where the tool may be used.

Safety in the workplace is the number one concern of employers. It should also be the major concern of each employee.

SAFE-USE PRACTICES

1. Keep your work area clean. Slipping on oil or tripping on clutter can lead to accidents.
2. Wear eye protection if there is any risk of flying particles.
3. Maintain proper balance. Do not overreach.
4. Check electrical supply cords to ensure that tools are properly grounded and that no bare wires are exposed.

5. Keep all guards in good working order. Never remove or tamper with guards.

6. Do not force any tool. Use the tool only to do tasks it was designed for.

7. Unplug the power supply to tools that are not in use.

8. Wear a dust mask if an excess of dine dust is created.

9. BE ALERT! Anticipating danger is the best way to avoid it.

10. Unplug power supply when making an adjustment to any power tool.

POWER SAWS

Circular saws and sabre saws are two types of portable power saws that are commonly used both in the workplace and in the home workshop.

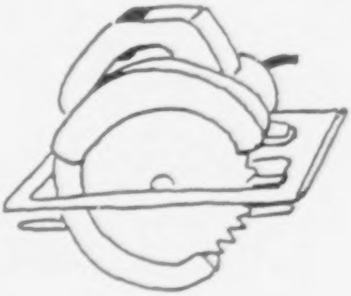
Circular Saws

Portable circular saws are capable of making straight cuts in a variety of materials.

The size of the saw is identified by the diameter of the blade. As a rule, the larger the diameter of the blade, the more powerful the motor of the saw and the greater the depth of cut.

Portable circular saws can be used to both rip and crosscut. The depth of the cut can be controlled by raising or lowering the base. Bevel cuts can be made by adjusting the tilt of the base.

The portable circular saw is usually guided free-hand along a pencil line or chalk line so its accuracy depends on your guiding skill as the operator.



Portable Circular Saw

Straight cuts can be made using the rip guide, a standard attachment with most circular saws. Even more accurate cuts can be made by securing a straightedge to the work and running the base of the saw along the straightedge during the cut.

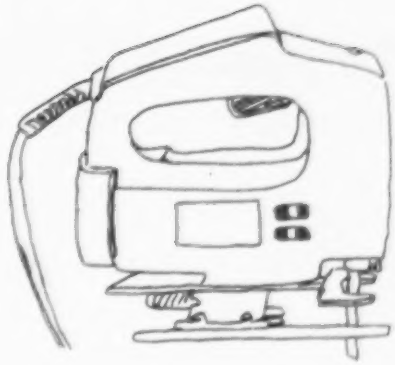
Portable circular saws are capable of starting a cut in the middle of a work piece. This feature makes the portable circular saw an ideal tool for cutting rectangular holes in the middle of a sheet of plywood, something not easy to do with a handsaw.

Sabre Saws

Sabre saws are used to make curved or irregular cuts in wood, plastics or metal.

The blade action is a high speed up-and-down motion, with the cutting taking place during the up stroke.

The sabre saw is designed mainly for light cutting but is capable of making cuts through materials 40 mm to 50 mm. The blade length should be such that when the blade is at the top end of its stroke, the lower end of the blade is below the bottom of the stock being cut.



Sabre Saw

The sabre saw is capable of starting a cut in the middle of a piece of wood. It is, however, much easier and safer to drill a starter hole through the work piece and use the hole as the start of the cut.

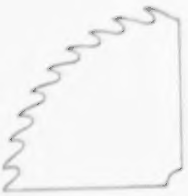
The rapid up-and-down action of the blade may cause the work piece to chatter. The work, therefore, piece must be secured and the sabre saw held firmly against the work.

SELECTING SAW BLADES

There are several types of blades available for each type of portable power saw. Each type of blade is designed for a specific purpose. Selecting the correct blade for the job will ensure a better cut and a longer lasting saw blade.

Rip Blade

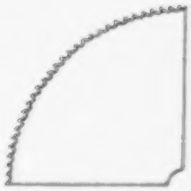
Rip blades are designed to cut solid lumber along the length of the stock. The teeth are square across their cutting edge and will cause chipping if used for cross cutting.



Rip Blade

Crosscut Blade

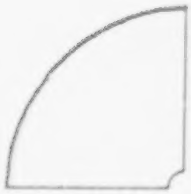
Crosscut blades have teeth sharpened to a knife-like point. They will produce a smooth, chip-free cut across the grain of solid lumber and they are ideal for cutting plywood regardless of the direction of the cut.



Crosscut Blade

Plywood Blade

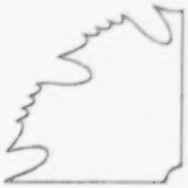
The plywood blade is a fine-toothed crosscut blade. The plywood blade is especially useful for cutting thin panelling.



Plywood Blade

Standard Combination Blade

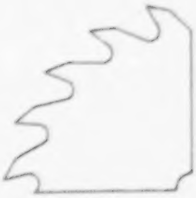
This blade will provide an adequate cut with or across the grain of solid wood as well as on various plywoods and panel products.



Standard Combination Blade

Chisel Combination Blade

The chisel combination is a popular blade for cutting solid lumber and plywood. The teeth are sharpened square across the front and on a bevel across the back forming a slight point on the cutting edge. The blade is easily sharpened and, when sharp, cuts fast and produces edges smooth enough for most types of jobs.



Chisel Combination Blade

Metal Cutting Blades

Non-ferrous metals can be cut with metal cutting circular blades. The blade resembles a plywood blade, but the teeth are square across the cutting edge like those of the rip saw. These blades usually require lubrication on their sides to prevent the waste material from sticking to the blade. The most common type of lubricant is a wax-stick which is rubbed on the sides of the blade.

Ferrous metals (metals which form sparks when ground) can be cut with an abrasive blade. The blade has no teeth and simply grinds a thin cut through the metal. The abrasive blade must be matched to the hardness of the steel being cut. Otherwise, the blade will either cut very slowly or wear out very quickly.

Metal Cutting Blade

MASONRY BLADES

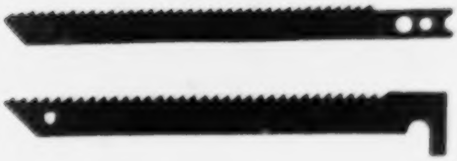
Masonry products are cut with an abrasive wheel similar to the type used for ferrous metals. Because masonry blades and ferrous cutting blades are similar in appearance, check to make sure you have the correct type of blade. Masonry blades will not cut metal and metal cutting blades will not cut masonry.

CARBIDE-TIPPED BLADES

Carbide-tipped blades remain sharp much longer than conventional steel blades. They can be used to cut wood, plastic, composition board, as well as non-ferrous metals.

SABRE SAW BLADES

There are two types of blade ends widely used in industry: straight and hooked. These two types are designed to fit two different types of sabre saw chuck, and they **cannot** be interchanged. Whenever you are changing or replacing a sabre saw blade, make sure the new blade has the correct type of end for the chuck on the sabre saw.



Plywood Cutting Blades

SAFE-USE PRACTICES

Circular and Sabre Saws

1. Portable power saws are prone to kickbacks. A kickback is what happens when the blade becomes pinched in a saw-cut. The entire force generated by the motor is directed to making the saw back out of its cut. The action is usually quite violent and occurs with little or no warning.

2. To avoid kickbacks:
    - be sure to use a blade that is both sharp and has adequate set.
    - maintain a straight cutting path.
    - support the stock you are cutting in such a way that the:
        - waste can fall away from the stock
        - saw-cut will open rather than close as the cut nears completion
        - material is prevented from any movement when the cut is completed.

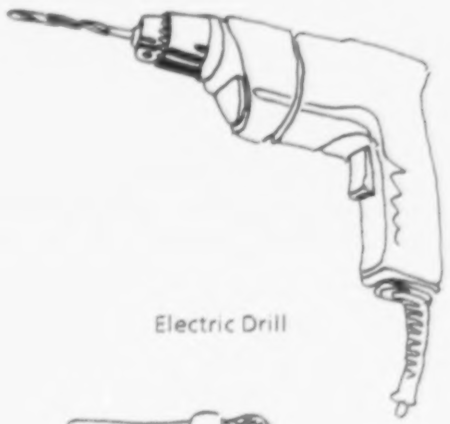
3. The best way to avoid injury when using a portable power saw is to:
    - maintain a firm grip on the tool during use.
    - secure material being cut to prevent it from moving.
    - use both hands on the saw whenever possible.
    - never reach under the saw during a cutting operation.

4. Always clean and return saw to its proper place after use.

PORTABLE POWER DRILLS

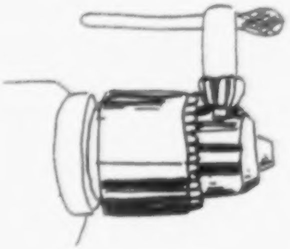
A power tool common to most trades is the portable electric drill. Electric drills are used for a variety of tasks from drilling holes or driving screws to stirring paint.

Most electric drills are manufactured with a pistol grip. A trigger switch is located on the handle to allow for single-handed use during light-duty operations. During heavier drilling operations two hands should be used, one applying force to the back end of the drill and the other holding the pistol grip handle to counteract the turning force generated by the drill.



Electric Drill

The drill bit is secured to the portable power drill by means of a three-jawed chuck. The chuck can be opened and closed by rotating the knurled outer sleeve, but final tightening should be done with a special wrench known as a chuck key.



Chuck and Key

CONTROL SWITCHES

Some portable electric drills have a switch which is simply an ON – OFF switch. When engaged, this switch will bring the drill to full speed (usually in a clockwise direction); when the switch is turned off, the drill coasts to a stop. This type of switch limits the use of the electric drill to those operations which require a clockwise rotation of the chuck at the fixed speed at which the chuck of that particular drill turns.

Many drills are manufactured with a variable speed switch. These switches provide the user control over the speed at which the chuck turns. This control over speed allows you to use the electric drill for a variety of tasks. For example, driving screws and drilling masonry require a slow-turning drill, while drilling holes in wood requires high-speed.

An additional switch found on most larger drills allows the motor to turn counterclockwise as well as clockwise. When both a variable speed switch and a reversible switch are present on an electric drill, the drill can be used to remove screws as well as drive them. The reversing feature also allows the drill to be used to cut internal screw threads with a tap – a process which is much easier and faster when done with a drill than when done by hand.

Always allow the motor on a reversible drill to come to a complete stop before switching the motor direction. Failure to do so will lead to an early breakdown of the motor.

SAFE-USE PRACTICES

1. When using an electric drill, be aware that the bit may jam. To safeguard against possible injury due to jamming, do not lock-on the "on" control switch on the drill handle. Control the drill by gripping the trigger. Releasing your grip on the trigger will immediately stop the drill and help to prevent injury.

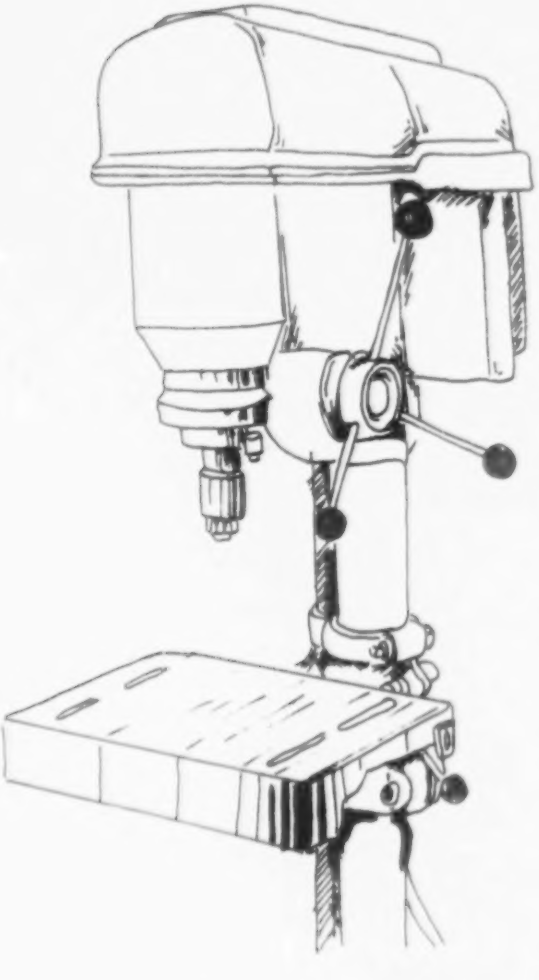
2. When using an electric drill, position yourself so that you have secure footing and a clearly visible work area.

3. Wear eye protection when using an electric drill.

4. Suggest that others around you wear eye protection if chips are flying.

THE DRILL PRESS

The drill press is a practical power tool because of its versatility and ease of operation. The most popular unit for all-around work is the 350 mm size. The name-size of a drill press comes from the largest circular piece of work which can be centre-drilled. On a 350 mm drill press the distance from the centre of the spindle to the front of the column is 175 mm.



CONSTRUCTION

The four basic parts of the drill press are the base, column, table and head. The head is the entire working mechanism attached to the upper end of the column. The table can be moved up and down on the column, swung to either side, or tilted as the work requires. The essential part of the head is the spindle, which revolves in a vertical position. It is housed in ball bearings at either end of a movable sleeve, known as the quill.

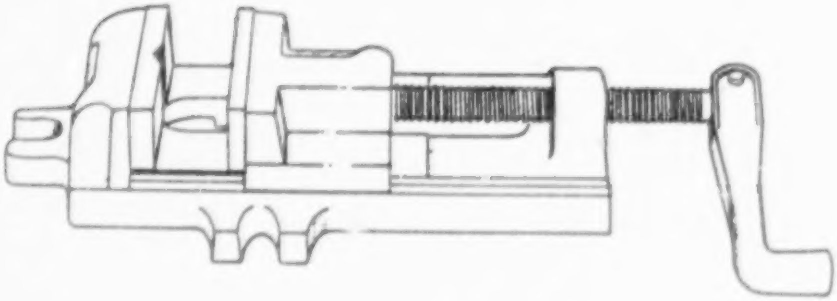
The quill, carrying the spindle inside, is moved downward by means of gears worked by the feed lever. The quill may be locked and preset to the depth to which it can travel.

POWER AND SPEED

The drill press is usually fitted with cone pulleys so that different speeds can be obtained. The average range is speeds of 680 to 4600 rpm. When the machine is used exclusively for metal work, a larger cone pulley is used on the spindle to give lower speeds of about 470 to 1950 rpm. A one-thrid horsepower motor meets all requirements for average work. One-third horsepower is the approximate power required to operate a 1/2" bit drilling through steel.

DRILLING METAL

When using the drill press to drill a piece of metal, place the piece to be drilled in a machine vice. This prevents the piece from moving and helps to prevent injury to the drill operator and possible damage to the drill press.



Machine Vice

DRILL SPEED

The unit "RPM" refers to "revolutions per minute". It is the unit used to measure the speed of a drill.

The best speed to use in any drill press operation is determined by the kind of material being drilled, the size of hole to be drilled, the type of drill or other cutter, and the quality of cut desired. The standard rule is: **the smaller the drill, the greater the required speed** in rpm. The speed should also be higher for soft materials than for hard ones.

On most drill presses, it is impossible to get the exact recommended speed, but you can come close by adjusting the drive belt. You will find instructions on adjusting in the manufacturer's manual. Your teacher will demonstrate this procedure for you. As well, there is usually a chart in the manual giving the various speed ratios for your particular drill press.

SUGGESTED SPINDLE SPEEDS — RPM

DRILL SPEEDS

*For intermediate sizes, use speed suggested for next larger hole
Use slower speeds for deep holes or if drill bit burns or melts material

Hole Size * – inch	mm	Softwoods	Hardwoods	Plastics	Aluminum	Brass	Cast Iron	Mild Steel
1/16	1.5	4700	4700	4700	4700	4700	4700	2400
1/8	3	4700	4700	4700	4700	4700	2400	1250
3/16	4.5	4700	2400	3400	4700	2400	2400	1250
1/4	6	2400	2400	2400	4700	2400	1250	700
5/16	8	2400	2400	2400	4700	2400	1250	700
3/8	9.5	2400	1250	1250	2400	1250	700	700
7/16	11	2400	1250	1250	1250	1250	700	
1/2	13	1250	1250	1250	1250	700	700	
5/8	16	1250	700	700	700			
3/4	19	1250	700	700	700			
7/8	22	1250	700					
1	25	700	700					
1 1/4	32	700	700					
1 1/2	38	700	700					
2	50	700	700					

SAFE-USE PRACTICES FOR THE DRILL PRESS

1. NEVER ATTEMPT TO HOLD THE WORK BY HAND. Use a metal vice or clamp to prevent the work from spinning.

2. USE A FACE SHIELD WHEN DRILLING. Drill press operations create a hazard of flying chips.

3. Never set speeds or adjust the work unless the machine is stopped.

4. Keep your head well back from revolving parts of a drill press to prevent your hair from being caught.

5. As the drill begins to break through the work, ease up on the drilling pressure and allow the drill to break through gradually.

6. Always remove burrs from a drilled hole with a file or scraper, NOT WITH YOUR HANDS.

7. Never leave a chuck key in the drill chuck at any time.

8. Never attempt to grab work which may have caught in the drill. Stop the machine.

9. Always position the table or the vice so that the drill bit will not damage either of them as it penetrates through the work.

10. Before starting a drill press, check that the speed setting is set appropriately.

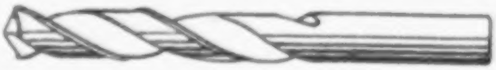
INFORMATION SHEET #14

SELECTING DRILL BITS

There is a large selection of drill bits available for use in portable power drills. Some drill bits may be suited to a wide range of materials while others are suited to only one type of material.

TWIST DRILLS

Twist drills are used to drill holes in metal, wood and plastics. Twist drills are available in size designated by one of four different systems: fractional, letter, number and metric.



Twist Drill

Twist drills are available in increments of 0.1 millimetre from 0.5 mm to 15.5 mm with larger sizes available on special order.

The point of a twist drill is ground to an angle of 118° for general purpose drilling. Harder metals require a blunt point while soft materials such as plastics or wood are better drilled with a sharp point.

SPADE BITS

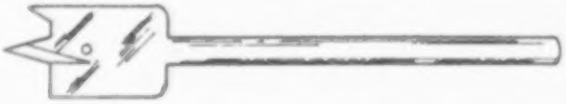
The spade bit is designed to drill only into wood products. Diameters of drill bits range from 9 mm to 38 mm.

The quality of the cut produced by the spade bit is inferior to most other bits. Therefore, its use is limited to rough work.

Spade Bit

SPUR BITS

Spur bits are designed to cut clean, tear-free holes in wood products. The centre point guides the bit into the wood. The spur slices through the wood along the circumference of the hole in advance of the drilling action.



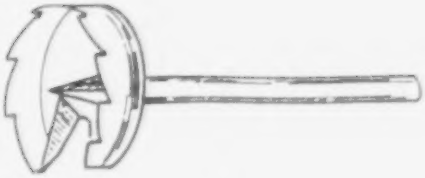
Spur bits are excellent for drilling clean, accurate, but shallow holes. Sizes range from 9 mm to 25 mm in diameter.

Single-Spur Bit

MULTI-SPUR BITS

A close relative to the single-spur bit, the multi-spur bit, uses the sides of the hole rather than the point of the bit to guide it while drilling. Having a very short centre point, the multi-spur bit drills virtually flat bottomed holes.

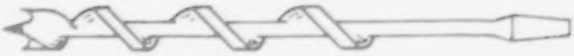
Multi-spur bits are available in sizes from 25 mm to 75 mm. Their cutting action cuts clean, but shallow holes.



Multi-Spur Bit

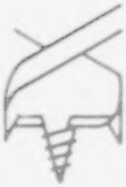
AUGER BITS

Auger bits drill clean, accurate, straight and deep holes. The bit is guided by both the point of the bit and the sides of the hole. Waste from the hole is carried to the surface by the spiral flutes.



Auger Bit

Points of auger bits may be threaded or non-threaded. Never use an auger bit in a power drill unless the point of the bit is non-threaded. If threads are present, the bit will jam and stall the power drill. Auger bits with threaded points are only suitable for use in a hand brace (brace and bit).

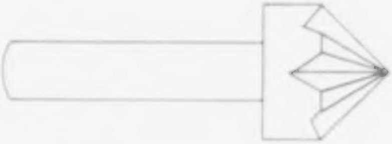


Threaded Auger Bit

COUNTERSINK BITS

When flat head screws are to be installed flush or below the surface of a workpiece, the countersink bit will drill a broad shallow hole to receive the head of the screw.

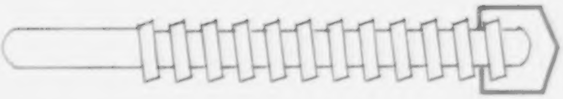
Countersink bits may be used before or after the pilot hole for the screw shank and threaded portion has been drilled.



Countersink Bit

CARBIDE-TIPPED BITS

Carbide-tipped drill bits are used to drill holes in hard, abrasive materials such as concrete, stone, masonry, brick and ceramic tile.

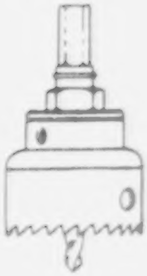


Carbide-Tipped Bits

Drilling into these materials requires a slow-turning drill (350-500 rpm) to prevent the bit from overheating.

HOLE SAWS

The hole saw is designed to cut large diameter holes in wood or sheet metal. The hole saw has a pilot bit at its centre which enters the work piece ahead of the hole saw and serves to guide the hole saw as it enters the work piece.



Hole Saw

Hole saws are available in sizes from 14 mm to 111 mm in diameter. The depth of the hole drilled is restricted by the length of the hole saw. Standard lengths are 12 mm or 28 mm.

SAFE-USE PRACTICES FOR POWER DRILLS:

1. Power drills are rotating tools, therefore when using a power drill do NOT wear:
    - a necktie/necklace or other dangling jewelry
    - long hair unless it is tied back
    - loose clothing that may be caught in the rotating drill
2. Always secure the work piece.
3. Never lock the switch in the "ON" position.
4. Always clean and return drill to its proper storage place after use.

INFORMATION SHEET #15

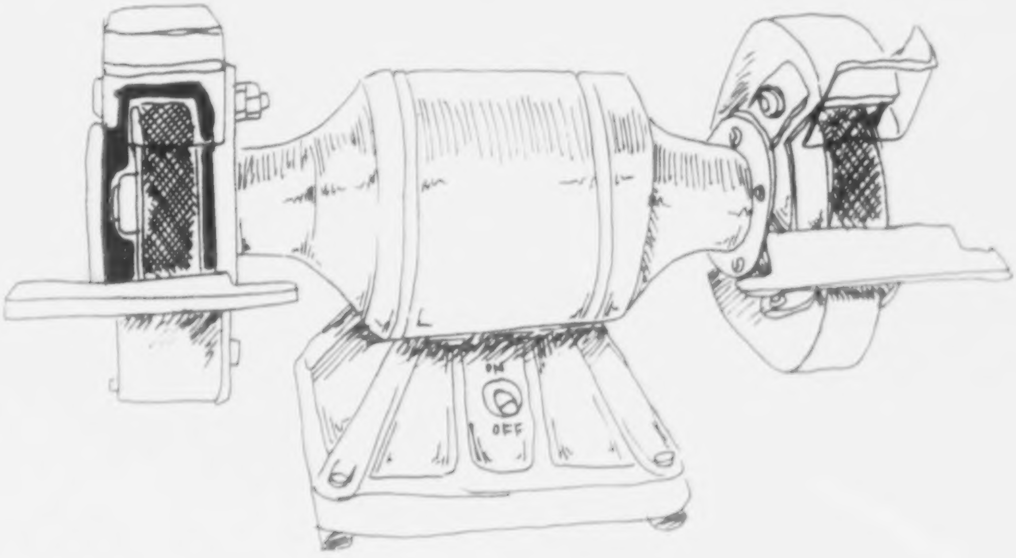
BENCH GRINDERS

Bench grinders are used in many trades. The bench grinder is said to be a "labour-saving device". It may be used for cleaning, shaping, brushing, buffing and for sharpening twist drills, chisels, tool bits, or other small tools.

The bench grinder wheels revolve at very high speed. To avoid personal injury, you must develop a set of skills that will enable you to adjust the tool rest and spark deflector, change the wheels, and hold the work against the grinding wheel.

BENCH GRINDER BASICS FOR POWER DRILLS:

Bench grinders are basically an electric motor mounted on a metal base that fastens to a workbench. The base has two or four mounting holes near the corners. An armature shaft (spindle) projects from both ends of the electric motor. Grinding wheels (usually one coarse and one fine) are mounted on the ends of the shaft. Shaft sizes vary from 5 mm to 7.5 mm depending on the grinder size. Grinding wheel guards, mounted on the motor, enclose the wheel except for the exposed portion in front. These guards help protect the operator from flying abrasive particles and ground metal. The guard ends can be removed to change grinding wheels. The lower section at the rear of the guard may have an outlet for a dust collecting system.



Standard Bench Grinder

SAFE-USE PRACTICES

1. The correct position when operating a bench grinder isto stand to one side.

2. Keep the work area clean and free of tools and other objects.

3. Wear appropriate apparel. Loose clothing or jewelry is hazardous and should not be worn in the shop.

4. In others near the work area are wearing protective equipment.

5. Remove anything that produces explosive vapours from the shop before using the bench grinder because of the danger from sparks.

6. When you are using the grinder, allow it to reach full speed before beginning to grind. Support the work on the tool rest and hold the work with both hands. Stand slightly to the side of the wheel and press the work lightly against the front face of the wheel. If the grinding is progressing satisfactorily, you may apply additional pressure. Do not, however, force the work, so tightly against the wheel that overheating or a considerable drop in rpm is noticeable.

7. Never use a bench grinder without a tool rest.

8. Adjust the tool rest to proper position.

9. Always wear eye protection when grinding.

10. Report unusual movements of grinder to the teacher or supervisor.

11. Clean-up tools adn work area after use.

EVALUATION SHEET
WOODWORK: USING PORTABLE POWER TOOLS

Student's Name ______________________ Date ____________________

Course ____________________________

Mark __________

Items to be Evaluated	Mark	Mark Attained
1. Identifies power woodworking tools correctly	3	
2. Measures stock correctly	3	
3. Uses a power saw correctly	3	
4. Uses a power drill correctly	3	
5. Uses a power grinder correctly	3	
6. Uses a drill press correctly	3	
7. Identifies drill bits correctly	3	
8. Selects correct drill bit for job	3	
*9. Returns all tools to correct storage area	3	
*10. Cleans work area to shop standards	3	
*11. Follows all safety procedures	5	
*These items must be completed to 100% accuracy		
Total	40	

Comments ____

____

Teacher's Signature ____________________ Student's Signature ____________________

EVALUATION SHEET
METALWORK: USING PORTABLE POWER TOOLS

Student's Name ____________________ Date ____________________

Course ____________________

Mark __________

Items to be Evaluated	Mark	Mark Attained
1. Identifies metal work tools correctly	3	
2. Uses eye protection during all operations	2	
3. Uses a metal cutting saw correctly	2	
4. Uses a portable drill correctly	2	
5. Uses a drill press correctly	2	
6. Uses a grinder correctly	2	
7. Clamps work piece to table or machine vice before using drill press	2	
*8. Returns all tools to correct storage area	3	
*9. Cleans work area to shop standards	3	
*10. Follows all safety procedures	4	
*These items must be completed to 100% accuracy		
Total	40	

Comments ____

____

Teacher's Signature ____________________ Student's Signature ____________________

JOB SHEET #3
USING POWER WOODWORKING TOOLS

Three power tools are used in this practical exercise: the portable electric saw, the sabre saw, and the electric drill. Teachers are encouraged to develop additional job sheets that will provide practical exercise using other power wood workign tools. Three jobs are required:

1. Cut a length of wood stock using a circular saw.
2. Cut a piece of plywood using a sabre saw.
3. Drill three holes in a piece of wood stock using an electric drill.

REQUIREMENTS

Tools

- two clamps
- portable circular saw with rip and crosscut blades
- sabre saw
- framing square
- measuring tape
- workbench with a vice
- electric drill with 32 mm bit
- safety glasses, goggles or face shield
- compass
- two sawhorses

MATERIALS

Wood Stock Pieces

1 pc. 38 mm x 140 mm – approximately 1 m or more in length

1 pc. 19 mm plywood – approximately 300 mm square

PROCEDURES

The teacher's instructions must be followed closely and carefully. If in doubt about what to do, STOP and ask the teacher for HELP.

1. Using the Circular Saw

   a. Use the framing square and a pencil to mark for a square cut on one end of the 38 mm x 140 mm stock.

   b. Install a crosscut blade in the portable circular saw and cut the stock along the pencil line. **Eye protection must be worn.**

   c. Cut the other end of the stock square.

   d. Install a rip blade in the saw. Set the rip guide to produce a 50 mm wide piece from the 38 mm x 140 mm stock. Place the stock across the two sawhorses and rip a 50 mm piece from the stock. Make sure the depth of cut is just slightly more than the stock thickness.

   e. Replace the crosscut blade in the saw and cut a 150 mm length from each piece of stock. Save all pieces.

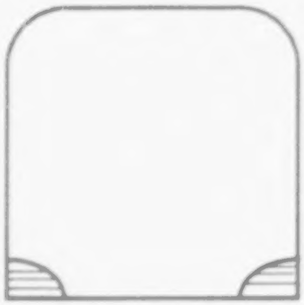
2. Using the Sabre Saw

   a. Set the compass to a 50 mm radius and lay out a quarter circle at each corner of the plywood.

   b. Cut along the waste side of the layout lines with the sabre saw.

   Note:

   The sabre saw will chip the surface to one side of the cut when travelling against the grain.



Quarter Circle Cut-Out Areas

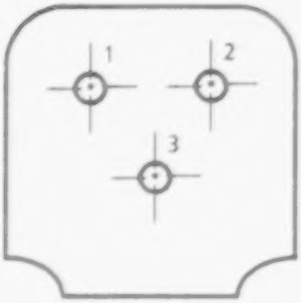
If you notice the chipping is not on the waste side of the cut, you can remedy this situation by stopping and completing the cut from the opposite direction.

3. Using the Electric Drill

a. Lay out the plywood to drill three holes. Holes 1 and 2 have their centres 75 mm from the edges while hole 3 is centred on the board.

b. Mount the 32 mm bit in the electric drill and drill a test hole in a piece of lumber from your circular sawing job.

c. Clamp the plywood in the vice and drill hole No. 1 clean through. Notice the tearing as the bit exits the material.



Position of Holes on Plywood

d. Drill part way into hole No. 2 until you feel or see the point of the bit coming through the back of the plywood. Stop drilling and turn the plywood front to back in the vice. Continue drilling hole No. 2 from the back side of the plywood. The hole should be splinter free on both faces.

e. Turn the plywood in the vice so that the layout for hole No. 3 is facing you. Clamp a piece of scrap wood on the backside of the plywood covering the entire area of hole No. 3.

f. Drill clean through the plywood from the face side. Remove the scrap wood. Hole No. 3 should be splinter free on both faces.

g. Clean up your work station to shop standards and return all tools to storage except for the twist drill, safety glasses and drill grinding gauge.

EVALUATION SHEET
USING POWER WOODWORKING TOOLS
(JOB SHEET #3)

Student's Name ______________________ Date ____________________

Course ____________________________

Mark __________

Items to be Evaluated	Mark	Mark Attained
1. Correct blade used for ripping	3	
2. Ripped stock measures 50 mm	3	
3. Ripped edge is at 90° (square) to face	3	
4. Both pieces of stock correct length	3	
5. All four ends are trimmed square	3	
6. End cuts are straight	3	
7. No burn marks on stock from saw	3	
8. Correct blade used for crosscutting	3	
9. Plywood corners rounded at 50 mm radius	3	
10. Three of the four corners are free of chipping	3	
11. All three holes drilled according to instructions	3	
*12. Returns all tools to correct storage area	5	
*13. Cleans work area to shop standards	5	
*14. Follows all safety procedures	7	
*These items must be completed to 100% accuracy		
Total	50	

Comments ____

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Teacher's Signature ______________________ Student's Signature ______________________

JOB SHEET #4
USING POWER METALWORKING TOOLS

This job involves grinding and drilling holes in a piece of metal stock.

REQUIREMENTS

Tools

- power metal-cutting saw
- drill press
- portable power drill
- assortment of twist drills
- stationary grinder
- safety glasses and/or face shield
- portable grinder
- centre punch and hammer
- drill grinding gauge
- drill press vice or C-clamp
- leather gloves

MATERIALS

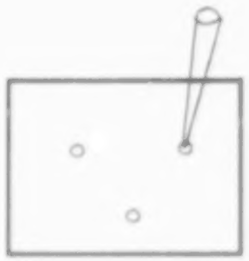
Piece of Scrap Metal

PROCEDURE

The teacher's instructions must be followed closely and carefully. If in doubt about what to do, STOP, and ask the teacher for HELP.

1. Wear eye protection during the cutting operation: safety glasses if you are using a bandsaw; face shield if you use an abrasive cut-off saw. Wear gloves if the cutting operation creates excessive amounts of heat.
2. Obtain a portable grinder and take it to a work station which has a vice.
3. Mount one piece of scrap metal in the vice, and wearing eye protection and gloves if needed, grind the piece of metal as directed.

4. Obtain a portable drill and mount a medium-size twist drill into its chuck. Use the centre punch and hammer to mark the locations of three holes in the same piece of metal used for the portable grinding exercise.



5. Clamp the scrap metal in the vice so that the three hole locations are visible and drill one medium-size hole.

6. Replace the bit with a smaller bit and drill the next hole.

7. Replace the small bit with one of the larger bits and drill the third hole.

8. Repeat the same drilling exercise (steps4-7) using the drill press. Make sure the workpiece is firmly clamped to the table and the correct speeds are selected for each size of drill bit.

9. Check the grinding wheels on the stationary grinder for embedded metal particles and for roundness.

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EVALUATION SHEET
USING POWER METALWORKING TOOLS
(JOB SHEET #4)

Student's Name ______________________ Date ____________________

Course ____________________________

Mark __________

Items to be Evaluated	Mark	Mark Attained
1. Correct eye protection worn during all operations	3	
2. Metal cutting saws were used correctly	3	
3. Portable grinder used correctly	3	
4. Work piece secured in vice for portable grinding	3	
5. Portable drill was used correctly	3	
6. Drill press speed setting were correct for bit sizes used	3	
7. Workpiece clamped to table during drill press operation	3	
8. Grinding wheel was checked for roundness and cleanliness	3	
*9. Returns all tools to correct storage area	4	
*10. Cleans work area to shop standards	4	
*11. Follows all safety procedures	8	
*These items must be completed to 100% accuracy.		
Total	40	

Comments ____

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Teacher's Signature ____________________ Student's Signature ____________________

SUGGESTED TEACHING STRATEGIES

A variety of strategies and sample activities useful in gathering, interpreting, recording, evaluating and communicating ideas in the occupational courses are provided with the suggested activities and student resources included in this manual and in the *Program of Studies/Curriculum Guide*. In addition, the following strategies can be used effectively to support students in their use of language and thought processes in many areas of each of the occupational courses:

- AVID: A Strategy for Transfer
- Brainstorming
- CARE: A Safety Strategy
- CARING: A Listening Strategy
- CROSSWORD PUZZLE: A Comprehension Strategy
- Descriptive Writing: An Evaluation Guide
- First Letter Mnemonic: A Remembering Strategy
- Flow Charting: A Process Analysis Strategy
- Improving the Instructional Environment
- LEEP, CHECK: Oral Presentation Strategies
- A Guide to Effective Listening
- PMI: An Exploration Strategy
- Positive Self-Talk: A Self-Concept Building Strategy
- RAP: A Comprehension Strategy
- Reinforcing the Positive
- SCAMPER: An Idea Generating Strategy
- SCORER: A Test-Taking Strategy
- Speech Evaluation Guide
- SPOT: A Social Problem-Solving Strategy
- SQ3R: A Chapter Attack Strategy
- WIS: A Word Identification Strategy
- Writing Directions: An Evaluation Guide

A more detailed outline of each of the above strategies follows.

AVID: A Strategy for Transfer

Purpose

- to enable students to transfer concepts, skills and attitudes learned in one course to other courses.

Description of Strategy

A: Academics
V: Vocational
I: Interpersonal
D: Daily living

Procedure

After a strategy has been taught directly, students can be shown how to use the 'AVID' mnemonic as an aid for discussing and formulating academic, vocational, interpersonal and daily living applications of the strategy, or the principles derived from the strategy.

For example, organizational strategies initially taught in the academic "A" course may be discussed and applied to the vocational "V" (dress, materials for the job), interpersonal "I" (coming to appointments on time) and daily living "D" (organized room) areas.

Adapted from *SPELT: A Strategies Programme for Effective Learning/Thinking:* Inservice Edition (SPELT International, Ltd.), p. 196. Copyright 1987 by Mulcahy, R., et al. Reprinted by permission.

Brainstorming

Purpose

- to generate a large number of ideas that will lead to more creative problem solving
- to open students up to sharing ideas without fear of criticism
- to enable students to build on each other's ideas.

Procedure

1. Teacher states a specific problem or asks an open-ended question such as . . .
    - What other uses could you find for a ___?
    - In what other ways could you improve a ___?
    - List all the things that are soft and white.
2. Give the rules for "brainstorming":
    - Don't judge ideas during the brainstorming stage
    - Provide a safe environment; accept everything. (Evaluation should be done later as a separate follow-up activity.)
    - Encourage "far out" ideas
    - Build (piggyback) on other ideas
    - Don't stop too soon. Initial responses are often easily recalled from memory and usually are followed by a pause or a slowing down of ideas. Beyond this point, students are beginning to think more deeply. Many ideas are needed before really original thinking takes place. Remember, "quantity comes before quality"
    - Everyone should contribute, including the teacher, to demonstrate divergent thinking and to add encouragement.
3. Restate the problem or question and, as students give their responses, record the ideas, without comment.
4. When sufficient ideas have been recorded, then comment on the number and variety of responses.

CARE: A Safety Strategy

Purpose

- to stimulate students' awareness of the need to follow directions and safe operating instructions in the home, in school, and in the workplace.

Description of Strategy

C – Caution
A – Alertness
R – Responsibility
E – Everyday

Procedure

Students may be asked to:

- brainstorm examples for each letter of the mnemonic to increase the scope of their awareness
- design and produce a poster to display in context the application of the principles of CARE; for example, a student in a crafts and arts course may design a safety graphic and the graphic may be produced by students in a technical crafts course
- give examples of task related CARE activities they perform in the home, at school and in the workplace.

	CARE Activities
In the home	e.g., ensuring that electrical cords/wires are not frayed and damaged ● ● ●
At school	e.g., putting on safety equipment (e.g., goggles, gloves, ear protectors) before using power equipment and tools ● ● ●
In the workplace	e.g., frequently removing debris/waste from the work area ● ● ●

CARING: A Listening Strategy

Purpose

- to improve students' ability to listen effectively.

Description of Strategy

C – Cares about the message
A – Always looks at the speaker
R – Remains comfortably stationed (not fidgeting or moving around)
I – Is quiet (when being spoken to)
N – Notices details (so questions or replies can be formulated)
G – Greets speaker with a clear mind (tries to think only about what's being said)

Procedure

(a) During an oral presentation, note situations where students are not attending (i.e., not caring about the presentation, moving about, chattering to each other, working on an assignment). Lead a discussion around what it feels like to talk before a group of people who appear uninterested, and the consequences both to speaker and listener. Then present the "CARING" Strategy.

(b) Teach the "CARING" strategy as preparation for an oral presentation unit.

Adapted from *A Strategies Program for Effective Learning and Thinking* (Cognitive Education Project, University of Alberta). Copyright 1987 by Mulcahy, R., et al. Reprinted by permission.

CROSSWORD PUZZLE: A Comprehension Strategy

Purpose

- to increase students' word recognition ability and their ability to think creatively and sequentially

Procedure

Step 1 Think of a particular topic and the terms related to that topic (e.g., business – profit, loss, employer, employee, accounts).

Step 2 Write the terms in the grid, interlocking letters as often as possible, going across and down the page.

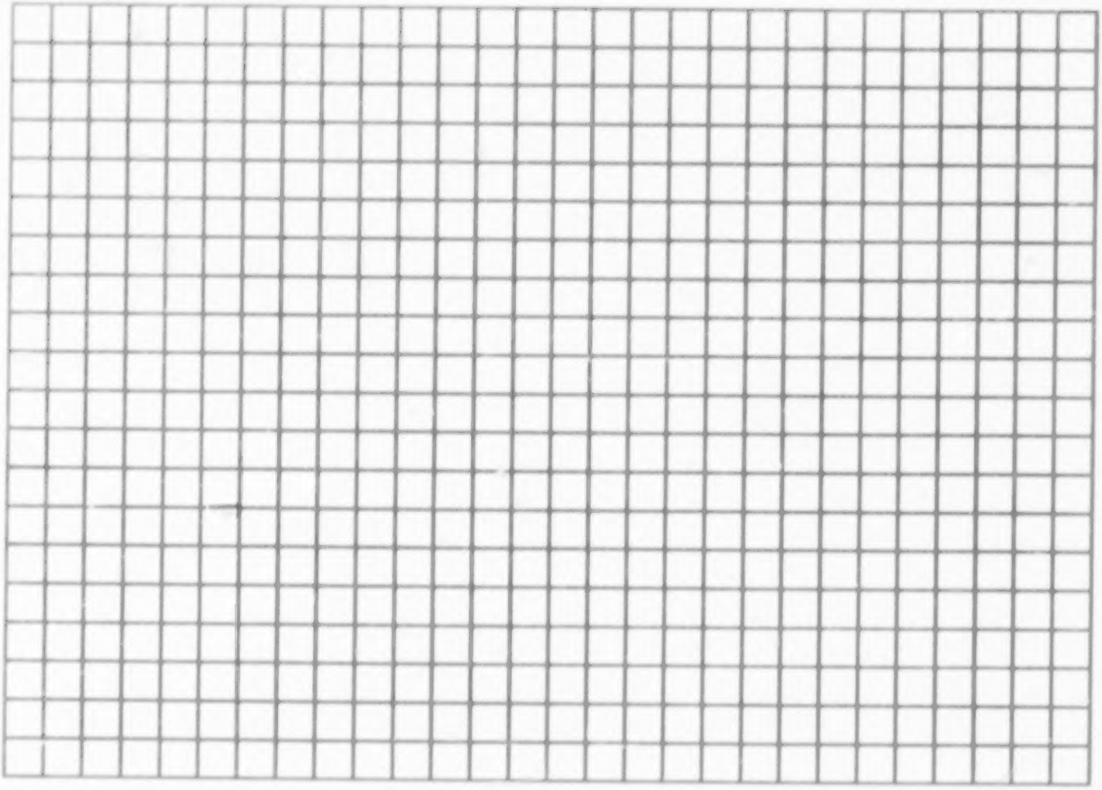
Step 3 Lay another sheet of paper over the grid and trace only those squares that contain letters. Or, with felt tip marker, fill in unused squares to form a dark background.

Step 4 Number the first square of each word going across and down.

Step 5 Number the "clues" or definitions in the same order in which you numbered them on the grid. (Put clues at the bottom of the page or on a separate sheet of paper.)

Step 6 Have students complete the crossword puzzle.

Crossword Puzzle Grid



Descriptive Writing: An Evaluation Guide

Purpose

- to help students to focus on the components of a descriptive writing assignment.

Procedure

The following evaluation guide is given to students before their assigned writing project or task.

Writing Assignment

Your assignment will be marked using the criteria below. Try answering the questions and marking your assignment yourself; then, revise your work to obtain a better mark.

	Possible Score	My Score
1. Did you list facts and opinions? Have you presented them separately?	4	
2. Is each fact and opinion presented in a full sentence? If you read each sentence separately, can you tell what it means without referring to the others?	4	
3. Are any of your statements not observations? Deduct one mark each time you find: • an opinion • an inference • a belief • a suspicion.	5	
4. Did you collect any quantitative data that can be tabulated? Have you presented these in a data table?		
Be sure your table has:		
• a title	2	
• a heading for each column	3	
• a unit expressed for each.	2	
Total:	20	

Scale Point

- The lists offer little accurate description. The description earns 0–9 points.
- Accurate description has been provided, but either the format of the presentation is weak or a great deal of irrelevant material – opinions, inferences, beliefs, suspicions – has been included. The description earns 10–14 points.
- Accurate description has been effectively presented. Data are appropriately tabulated. The description earns 13–20 points.

Adapted from the *Junior Secondary Science Curriculum Guide and Resource Book* by the British Columbia Ministry of Education. Copyright 1983 by the British Columbia Ministry of Education. Reprinted by permission.

First Letter Mnemonic: A Remembering Strategy

Purpose

- to assist students to remember word lists and other groups of information

Description of Strategy

F – Form first letters into words (upper-case)
I – Include other letters (lower-case)
R – Rearrange letters
S – Form a sentence
T – Try it many times

Procedure

Step 1: Form first letters into word, using upper-case letters (acronym).

Example: types of questions – Literal, Inferential, Evaluative, Decoding
LIED or DELI

If this step doesn't work, try Step 2.

Step 2: Include other letters (lower-case).

Example: Musical Instruments (Woodwinds).

F	O * r	C	E	P * t	S
Flute	Oboe	Clarinet	English Horn	Piccolo	Saxophone

* Lower-case letters help to form the word (mnemonic), **but do not** stand for a key word.

If this step doesn't work, try Step 3.

Step 3: Rearrange letters.

FOrCEPtS above was formed by rearranging the letters F P C O E S and adding r and t. Step 3 usually follows Step 2 in that for most word lists the first letters do not form a word without some rearrangement. If Step 3 doesn't work, try Step 4.

Step 4: Sentence formation (acrostic).

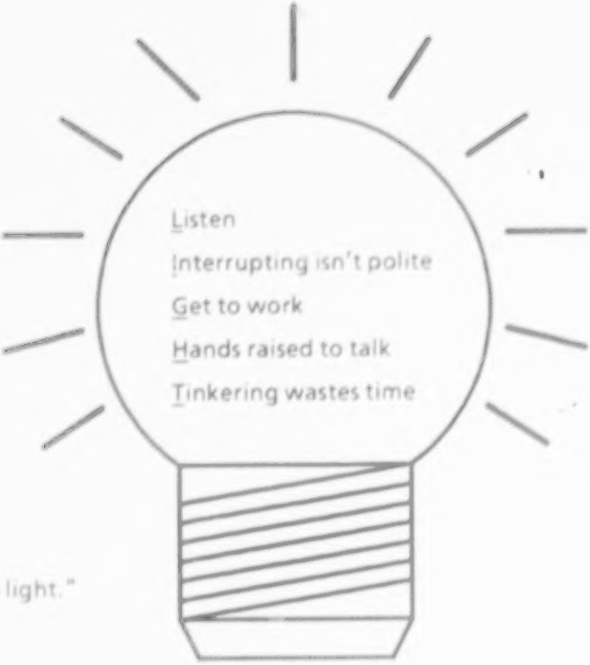
Father	Played	Clarinet	Or	English (horn)	Softly
Flute	Piccolo	Clarinet	Oboe	English Horn	Saxophone

Step 5: Try it many times. This step is a reminder to manipulate letters and words until a mnemonic is formed. Note the use of the word F I R S T as a mnemonic (Form, Include, Rearrange, Sentence, Try) to help remember this strategy.

Suggested Applications

- as a strategy to remember key words that relate to key concepts for an exam (studying strategy)
- to aid retention of strategies generated or taught
- home applications: shopping lists, things to do, etc.
- use first-letter mnemonic strategy to aid students in remembering classroom rules.

Example: L I G H T Strategy*


Listen
Interrupting isn't polite
Get to work
Hands raised to talk
Tinkering wastes time

"Flip a switch and be bright like a light."

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Flow Charting: A Process Analysis Strategy

Purpose

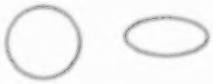
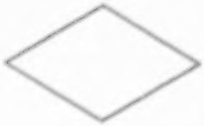
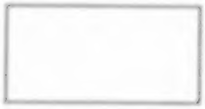
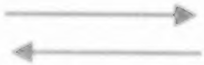
- to enable students to identify the order and sequence of steps in a procedure or process.

Description of Strategy

Students are taught to analyze the process involved in completing a task by constructing a flow chart that enables them to break the process into sequential steps, which then can be followed to complete the task.

A flow chart consists of a set of symbols connected by lines, which usually illustrate the sequential progression of steps involved in a procedure or activity.

Symbols used are:

A circle or an oval		start, stop
A diamond		question, decision
A rectangle		action
An arrow		directional lines

Procedure

1. Provide students with a task or have them identify a task.
2. Identify the components of the task.
3. List the components in sequence.
4. Draw a flow chart to show the major components of the task in sequence.

Improving the Instructional Environment

Purpose

- to enhance students' learning by improving the instructional environment.

The instructional environment plays a vital role in the development of creative thinking. Creative thinking can be fostered by:

- using appropriate questioning techniques
  - open-ended questions, ambiguous problems (e.g., find 1000 of something)
- providing openness
  - respect, acceptance and delight in unusual ideas
- providing enrichment activities
  - exciting materials that stimulate thinking
- allowing time for production
  - frequent opportunities for creative production
- providing time for idea development
  - to play, experiment, suppose, test, question, guess and expand the boundaries of conventional thought.

Description of Strategy

- **Affective Skill Development**

  A stimulating instructional envir[illegible]at accommodates the development of the affective skills which are the "feeling processes" of productivity. These affective skills are:

  CURIOSITY – the knack of wondering or puzzling.
  You are curious when:
  - you take a ____ apart to see what is inside
  - you ask "Why ...?"
  - you wonder "What if ...?"

  RISK TAKING – the courage to attempt something that may leave you open to criticism.
  You are a risk taker when:
  - you make a guess
  - you experiment
  - you try something new.

  COMPLEXITY – seeking an easier method; organizing; ordering.
  You are showing a preference for complexity when:
  - you set up an assembly line to make ____
  - you make up a schedule
  - you plan and organize a ____.

  IMAGINATION – visualizing, building images in the mind.
  You are using your imagination when:
  - you picture the setting of a story
  - you fantasize about the outcome of ____
  - you daydream.

- **Cognitive Skill Development**

The cognitive skills are the thinking processes of creativity. These are skills that can be taught, practised and applied in other areas of the curriculum. It is important to remember that creative thinking is a complex process which combines both the cognitive and affective skills. The following cognitive skills may be developed in each of the thematic learning activities:

FLUENCY – the ability to think of many possibilities.
You are being fluent when:
- you can list many ways to ____
- you can think of several ideas for ____
- you can think of more than one solution for ____.

FLEXIBILITY – the ability to shift directions of thought.
You are being flexible when:
- you can examine an issue from more than one viewpoint
- you can find other uses for a ____
- you can find different kinds of reasons to ____.

ELABORATION – the ability to stretch an idea to make it more interesting.
You are elaborating when:
- you add details and imagery to your story
- you add pictures, maps or tables to make a point clearer
- you add supplementary ideas to a main idea.

ORIGINALITY – the ability to express unusual alternatives.
You are being original when:
- you make something quite different from everyone else
- you can think of a new way to do something
- you think of an idea nobody else thought of.

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LEEP, CHECK: Oral Presentation Strategies

Purpose

- to provide students with memory cues when making oral presentations.

Description of Strategies

LEEP
L – Loud and clear
E – Expression
E – Eye contact
P – Posture

CHECK
C – Checking the audience
  - Is everyone ready to listen?
H – Having eye contact with the audience
E – Expressive
C – Clear
  - Make sure you speak so that everyone can understand your words
K – Keen to be heard
  - Show you're interested in what you're saying; be enthusiastic!

Teaching Example

Reinforce the use of LEEP or CHECK by integrating it into your marking scheme when presentations are made to the class. Reinforce to students that whenever they're speaking to others, whether in a group or individually (party, playground, dinner table, etc.), the same principles apply.

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A Guide to Effective Listening

Purpose

- to enhance students' listening ability.

Procedure

Provide each student with a copy of the listening guide below to use as preparation for listening to an oral presentation by a guest speaker or class member. Have students use their responses to the questions as a basis for later class discussions.

Use this guide as you listen to spoken presentations in class. When you have become familiar with it, you may wish to create your own personal listening study guide.

1. What is the general subject of this talk?
2. What is the specific occasion? (Give name of class, speaker's name and date.)
3. What is the chief point or main message? (This may be answered *after* the talk.)
4. What organizational plan does the speaker follow? (Is it enumeration? Comparison and contrast? Cause and effect? Generalization plus examples? A time or sequence pattern? Is it a mixture of patterns?)
5. What transitional expressions does the speaker use?
6. Does the speaker digress from the main point?
7. In what ways do you differ with the speaker?
8. What interested you the most? The least?
9. What is your personal reaction to the main point of the talk?
10. Write the speaker's main point in three or fewer sentences.

The following questions may also be used to stimulate discussion on the importance of effective listening skills:

- What helps you listen in class? At home? In the workplace?
- What prevents you from listening?
- How do you know when it is important for you to listen?
- What do you do to make yourself listen when you know you should, but you really don't want to?

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PMI: An Exploration Strategy

Purpose

- the PMI strategy is designed to aid students to explore a subject systematically and in depth, rather than just to support their position. Students are instructed to direct their attention to the "Plus" (P) aspects, then the "Minus" (M) aspects and, finally, the "Interesting" (I) aspects. The strategy also allows students to view how others think.

Procedure

1. A topic for discussion is assigned or arises during classroom dialogue.

2. Students are divided into small groups (of three or four) and instructed to divide a page in their workbooks into three columns and label them P, M, and I.

3. They are directed to think first about "Plus" (P) points regarding the discussion topic, and to write these points in the 'P' column. The same procedure is followed, in order, for the "Minus" (M) column and the "Interesting" (I) column. All points raised are to be accepted without judgment.

4. The points raised in the small groups are shared with the whole class.

Suggested Applications

1. This strategy can be used as a way to self-analyze and evaluate the present strategy used by the pupils. For example, the assigned topic could be "Do a PMI on the use of RAP strategy during the reading lesson we just completed". This analysis, with the whole class, should lead to modification of the strategies as your students apply them to various situations and settings.

2. Additionally, the PMI strategy could be used to assist pupils to think systematically and evaluate their positions in other domains (academic discussion topics, social domains, etc.).

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Positive Self-Talk: A Self-Concept Building Strategy

Purpose

- to assist students to enhance their self-esteem.

Procedure

1. Present your class with an assignment that is challenging for all students. As they attempt to complete the work, use verbal praise, directed toward the efforts being shown. Phrases such as "You can do it." "You're really trying hard." should be used. Circulate around the room to document overt student comments. Midway through task completion, stop the students in order to discuss:
    - why you were using praise as a motivation
    - your observation of their overt speech (If they were speaking to themselves, what were they saying?).

2. Guide the discussion toward the goal of understanding that, just as teachers use praise as a tool to motivate students, individuals can use positive self-talk as a strategy to motivate themselves. Through the use of positive self-talk they can redirect their attention **away from** self-criticism, feelings of incompetence and expectations of failure, **toward** the learning task at hand.

Suggested Follow-up Activities

Whenever students appear stressed, remind them (in a whisper) to monitor their thoughts and to use overt positive self-talk. In-class test preparation periods are ideally suited to this.

If students lack a positive vocabulary, spend time brainstorming with them to create a "master list" of positive phrases for their use.

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RAP: A Comprehension Strategy

Purpose

- to help students develop a strategy to improve their ability to comprehend written text.

Description of Strategy

R – Read
A – Ask
P – Put

Procedure

Have students:

1. Read the paragraph or instructions.
2. Ask themselves what they have just read.
3. Put the material they have just read into their own words.

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Reinforcing the Positive

Purpose

- to enhance I.O.P. students' self-esteem.

Procedure

Carefully observe individual student behaviours and, at every opportunity, reinforce correct and positive behaviour with words of praise. The following list provides 99 ways to say, "You did a good job".

1. SUPER GOOD!
2. You've got it made.
3. SUPER!
4. That's RIGHT!
5. That's good.
6. You're really working hard today.
7. You are very good at that.
8. That's coming along nicely.
9. GOOD WORK!
10. That's much better!
11. I'm happy to see you working like that.
12. Exactly right.
13. I'm proud of the way you've worked today.
14. You are doing much better today.
15. You've just about got it.
16. That's the best you have ever done.
17. You're doing a good job!
18. THAT'S IT!
19. Now you've figured it out.
20. That's quite an improvement.
21. GREAT!
22. I knew you could do it.
23. Congratulations!
24. Not bad.
25. Keep working on it, you're improving.
26. Now you have it!
27. You are learning fast.
28. Good for you!
29. Couldn't have done it better myself.
30. You are a joy.
31. One more time and you'll have it.
32. You really make my job fun.
33. That's the right way to do it.
34. You're getting better every day.
35. You did it that time!
36. You're on the right track now!
37. Nice going.
38. You haven't missed a thing.
39. WOW!
40. That's the way!
41. Keep up the good work.
42. TERRIFIC!
43. Nothing can stop you now.
44. That's the way to do it!
45. SENSATIONAL!
46. You've got your brain in gear today.
47. That's better.
48. That was first-class work.
49. EXCELLENT!
50. That's the best ever!
51. You've just about mastered that.
52. PERFECT!
53. That's better than ever.
54. Much better!
55. WONDERFUL!
56. You must have been practising.
57. You did that very well.
58. FINE!
59. Nice going.
60. You're really going to town.
61. OUTSTANDING!
62. FANTASTIC!
63. TREMENDOUS!
64. That's how to handle that!
65. Now that's what I call a fine job.
66. That's great.
67. Right on.
68. You're really improving.
69. You're doing beautifully.
70. Superb!
71. Good remembering!
72. You've got that down pat!
73. You certainly did well today.
74. Keep it up!
75. Congratulations! You got it right.
76. You did a lot of work today!
77. Well, look at you go!
78. That's it!
79. I'm very proud of you.
80. MARVELLOUS!
81. I like that.
82. Way to go!
83. Now you have the hang of it.
84. You're doing fine.
85. Good thinking!
86. You are really learning a lot.
87. Good going.
88. I've never seen anyone do it better.
89. Keep on trying!
90. You outdid yourself today.
91. Good for you!
92. I think you've got it now.
93. That a good (boy/girl).
94. Good job, (student's name).
95. You figured that out fast.
96. You remembered!
97. That's really nice.
98. That kind of work makes me happy.
99. It's such a pleasure to teach when you work like that!

SCAMPER: An Idea Generating Strategy

Purpose

- to assist students to think creatively.

Description of Strategy

S – Substitute
C – Combine
A – Adapt
or A – Add
M – Magnify
or M – Minify
or M – Modify
P – Put to other uses
E – Eliminate
R – Rearrange

Procedure

Students are encouraged to use each letter of the mnemonic to generate answers to related questions.

SUBSTITUTE
- Who else can do this?
- Can another source of power, another person or place, be used instead?
- Can another ingredient or material be used?
- Can something else be used in place of one of the parts?

COMBINE
- Can parts of ideas be combined?
- Can purposes or uses be combined?
- Can functions or objectives be combined?

ADAPT
- What other ideas does it suggest?
- What can you copy, making some changes?
- What can you imitate?

ADD
- Add more details.
- Add another just like it.
- Add more parts, pieces.

MAGNIFY
- What would it be like if it were made bigger?
- Can you increase the time, strength or value?
- What would it be like if you increased the number?

MINIFY
- What would it be like if it were smaller?
- Can it be made lighter, lower, cheaper?
- What if it became rare?

MODIFY

- Change the colour, shape or materials.
- Can you change the function, purpose or condition?
- What new twists can be made?

PUT TO OTHER USES

- Can it be put to another use?
- Can you modify it for another use?
- Can you find something else to use in its place?

ELIMINATE

- Remove some of the parts or characters.
- Eliminate some of the functions, materials or uses.
- Remove the beginning or end.

REARRANGE

- Can you interchange parts?
- Can you rearrange the pattern or plan?

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SCORER: A Test-Taking Strategy

Purpose

- to prepare students to take exams that include written questions and/or instructions.

Description of Strategy

S – Schedule time
C – Identify clue words
O – Omit difficult questions
R – Read directions
E – Estimate answers
R – Review

Procedure

This strategy is designed to aid students to approach test taking systematically.

1. **S – Schedule** your time. The student must consider:

   (a) How many questions are there?
   (b) What are the weightings of the various questions?
   (c) Which questions are easy, difficult, fast, etc.? The time needed to complete each section should then be estimated (e.g., a multiple choice test of 120 questions with a one hour time limit is: 60/120 = .5 minutes per question).

2. **C – Clue words**. Most exam questions have built-in clues. Use them.

3. **O – Omit** the difficult questions. The following procedure is suggested to aid the students in this step.

   (a) Move quickly through the test on the first pass: don't dawdle; keep moving.
   (b) When a question appears easy or you're certain of the answer – answer it.
   (c) On the first pass, skip those questions that appear difficult. When a question is missed, mark the margin with a symbol (+ or ✓) to show that you need to come back to it.
   (d) When the easy and certain questions are answered, return to those skipped and marked with a symbol, and try again.
   (e) If you still are unable to answer on the second pass, mark the questions again by changing the "+" to "++" or ✓ to "✓ ✓". Keep moving.

4. **R – Read** the directions for the test and for each test question very carefully.

5. **E – Estimate** your answers. This could have two meanings, according to the type of test question:

   (a) Those involving calculations or problem solving – roughly estimate the "ball park" figure.
   (b) Multiple choice – take an educated "guestimate" at a possible answer if you are unable to answer the question on the third pass. Never leave questions unanswered unless you will be penalized for wrong answers.

6. Review:

   (a) Use every minute available to you. Return to the double checked (+ + or ✓ ✓), difficult questions first. Look for new clue words and hints. Next, review the single checked (+ or ✓) questions, and, finally, if there is time, the unchecked ones.
   (b) Only change answers if you have a good reason to do so.
   (c) Be sure all questions are answered.
   (d) Make certain that your name is **printed** on all separate sheets.

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Speech Evaluation Guide

Purpose

- to enable students to recognize the components of a good oral presentation and to enhance their ability to make oral presentations. The main purpose of oral presentations is to get students to develop self-confidence in talking in front of a group. They must try to establish a comfortable rapport with the group and control signs of nervousness! Choosing a topic they know a lot about, and being well prepared, will get them "off the hook" so they can work on the main purpose.

Procedure

In consultation with each student, decide on a topic and a date for an oral presentation. Encourage students to research their topic and practise their presentation. Have students use the speech evaluation guide to provide feedback to presenters.

SPEECH EVALUATION GUIDE

Speaker's Name: ____________________

Topic: ____________________

Date: ____________________ Time: ____________________ (minutes)

	Yes	Needs Improvement
1. The speaker was adequately prepared for the talk.	______	______
Comment: ______________________________		
2. There was a definite opening, body and conclusion to the talk.	______	______
Comment: ______________________________		
3. The speaker attempted to make eye contact with the audience.	______	______
Comment: ______________________________		
4. The speaker was able to control nervousness in front of the class.	______	______
Comment: ______________________________		
5. The speech was audible and clear to all listeners.	______	______
Comment: ______________________________		
6. The speaker used his notes or cards discretely so as not to interfere with the main purpose of the speech.	______	______
Comment: ______________________________		

Comment on the speaker's strongest point. ______________________________

Give one or two specific suggestions for improvement. ______________________________

SPOT: A Social Problem-Solving Strategy

Purpose

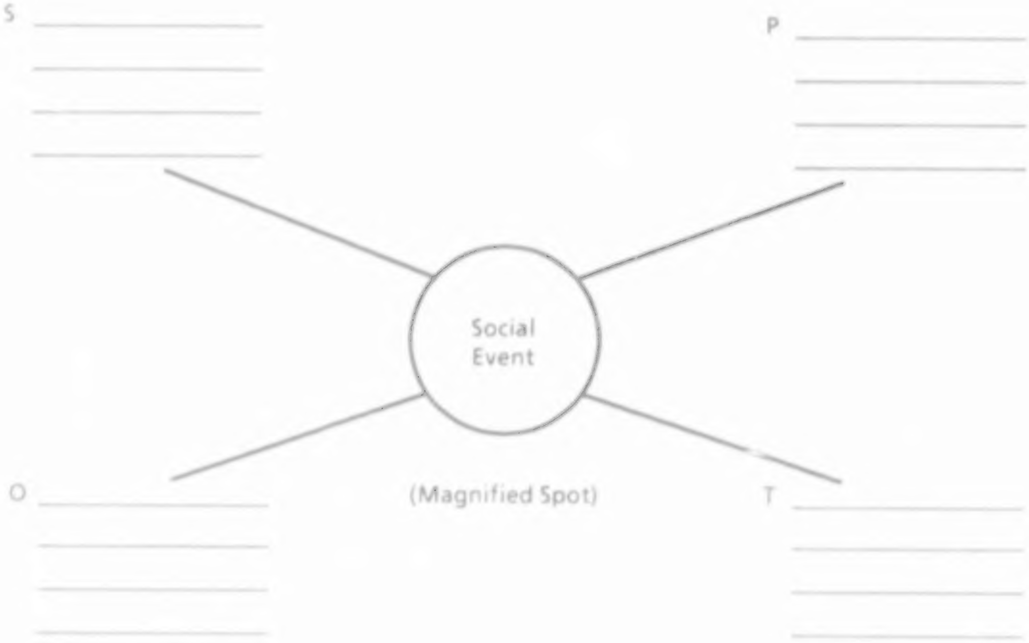
- to assist students to recognize and to analyze systematically a social situation before it becomes a social problem.

Description of Strategy

S – Setting: Who? What? Where? When?
P – Problem: What's the situation to be solved?
O – Order of action: What happened?
T – Tail end: What can be done next time?

Procedure

Problem-Solving Chart:



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SQ3R: A Chapter Attack Strategy

Purpose

- to enable students to use a systematic approach to reading and comprehension.

Description of Strategy

S – Survey
Q – Question
3R – Read, recite, review

Procedure

1. Survey – quickly read:
    (a) chapter introduction (beginning)
    (b) chapter summary (end)
    (c) first sentence in each paragraph
    (d) visual aids (pictures, graphs, diagrams).
2. Question – ask a question based on each sub-title.
3. Read – read each section to find the answer to your question.
4. Recite – write down the answer.
5. Review – say or write a summary of what you've learned.

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WIS: A Word Identification Strategy

Purpose

- to enable students to read new words.

Procedure

1. Choose a sentence containing a difficult word with which you are not familiar. Attempt to guess what it means by reading the words around it.
2. Look for a prefix. Look at the beginning of the word. Say it.
3. Look for a suffix. Look at the end of the word. Say it.
4. Locate the stem. Look at what's left after locating the prefix and the suffix.
5. Attack the stem by:
   (a) Using the rule of 2's and 3's. If the stem starts with a vowel, say it with 2 letters; if with a consonant, say it with 3 letters.
   (b) Two vowels together sound like one – try both sounds.
6. Look it up in a dictionary.
7. Ask someone.

Writing Directions: An Evaluation Guide

Purpose

- to enable students to write and evaluate a project plan.

Procedure

Have students write and evaluate a project plan before proceeding with the project.

PROJECT PLAN EVALUATION		
	Possible Score	My Score
1. The title is present and gives an indication of the purpose of the directions. An example might be, "How to Fly a Kite".	2	
2. Supplies and equipment are all identified and correctly classified.	2	
3. The instructions are listed		
• in complete sentences	3	
• in the correct sequence	4	
• without any omissions	4	
• in a numbered order	2	
• using present tense	2	
• without addressing "you".	1	
4. Safety hazards, if they exist, are identified and noted in the appropriate location.	2	
5. The overall organization is easy to follow.	5	
Total	27	

Scale Point

0-10	The directions are incomplete and/or in an inappropriate format.
11-15	There are serious problems with format and there may be omissions.
16-19	The instructions are logical although there may be some weaknesses in format.
20-27	A clear set of directions is presented in a standard format.

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INTEGRATED OCCUPATIONAL PROGRAM: OCCUPATIONAL COMPONENT

TEACHER SUPPORT MATERIAL

COURSE SEQUENCE, CREDITS AND CERTIFICATE REQUIREMENTS

The occupational component of the Integrated Occupational Program consists of twenty occupational course sequences. The following chart shows the sequence and credit value of each course and the minimum number of occupational courses required to obtain the Certificate of Achievement.

Grade	10	11	12
Sequence	16	26	36
Credits	3 or 5	10	10
Minimum number of courses	2 - 5 credit 4 - 3 credit	2	1

COURSE OBJECTIVES

The objectives of each 16-level occupational course are:

- to develop students' personal and interpersonal skills
- to increase students' awareness and appreciation of employment and entrepreneurial opportunities
- to make students aware of employment conditions in a variety of occupations
- to develop students' concepts, skills and attitudes.

COURSE OVERVIEWS

Each 16-level occupational course orients students to related occupations. There are two dimensions to each course:

1. Generic skills (i.e., concepts, skills and attitudes)

2. Work skills (i.e., occupation specific knowledge and skills).

The generic skills outlined as learning objectives in column one of the *Program of Studies/Curriculum Guide* are common to all 16-level occupational courses. Acquisition of the generic competencies identified as desirable at the Grade 10 level will provide students with a firm foundation on which to build a body of knowledge, skills and attitudes that is conducive to multiple employment opportunities.

The work skills for each course are outlined in the scope and sequence charts in the *Program of Studies/Curriculum Guide* and in the profile in each student workbook. **Teachers are advised to use the work skills as the context in which to teach the generic components of each course and are encouraged to supplement, complement and adapt the sequence of each set of work skills to suit the needs of their students, the availability of facilities and the opportunities for community partnerships.**

CONTENT SEQUENCE: REQUIRED AND ELECTIVE COMPONENTS

The content of each occupational course is outlined in the generic and work skills learning objectives. Both sets of objectives are designed to accommodate individual student's needs, interests and differences. Teachers should plan to engage students in activities designed to achieve the learning objectives outlined in the *Program of Studies/Curriculum Guide* and allow time for enrichment or remediation.

Students' interests and abilities will determine largely how the elective time will be addressed. Opportunities exist for experimenting with varying organizational and instructional strategies that facilitate learning and are appropriate to students' developmental stages and different learning styles.

The instructional time for each occupational course should be apportioned:

- 80 percent required
- 20 percent elective.

Elective extension and enrichment activities may include:

- designing and implementing a more complex project
- planning and organizing additions to the service components of the course
- developing increased levels of competency in performing specific work skills
- decreasing the amount of time required to perform specific work skills
- using higher levels of quality control specifications to evaluate a product or a service
- initiating small group, class and community projects
- coordinating and maintaining a record of partnership activities
- participating in in-school and community volunteer agencies.

Elective remedial activities may include:

- reviewing the content of the related 16-level occupational course in which the student appears weak
- relating new learning objectives to present life skills
- breaking a job into the smallest task units possible or necessary to enable the student to achieve incremental successes
- having more able students work with one or more of their peers to provide guidance, assistance and support
- using community partners as mentors for individual students.

COMMUNITY PARTNERSHIPS

Community partnership is a required component of each occupational course. In-school and off-campus exposure to the world of business and industry will increase student understanding of and commitment to essential concepts, skills and attitudes outlined for each course. In addition, the development of school-community partnerships increases community members' awareness of the educational process and enhances students' employment opportunities as part-time employees and as full-time employees upon graduation from high school.

STUDENT WORKBOOK

A student workbook has been developed for each occupational course. The contents of the workbook match the skills indicated in the work skills profile contained in each workbook.

Teachers are encouraged to supplement and adapt the sequence of instructional units to meet the needs and interests of students, taking into consideration the availability of facilities, and the opportunities for community partnerships.

INTEGRATION

Each course in the occupational component of the Integrated Occupational Program contains material that is directly related to learning contained in the core subject area profiles.

All teachers of the Integrated Occupational Program are encouraged to work closely with one another in both their instructional planning and delivery. The reinforcement of learning through integrated course development, integrated lesson planning and integrated delivery, will enable students in the Integrated Occupational Program to be better prepared to respond to the demands of schooling and better equipped for entry into the work force.

INSTRUCTIONAL FORMAT

Each 16-level occupational course is designed to be a hands-on course of instruction. Theoretical components, usually associated with instruction in similar areas, have been minimized.

While all of the concepts, skills and attitudes may be developed in a lab/classroom environment, student learning will be maximized through using community partnerships at every opportunity. Partnerships include in-school demonstrations and presentations, field trips, mentorships, as well as student placements in related work areas.

The greater the degree of parental and community involvement, the greater and more meaningful the learning experiences of the student are likely to be.

GENERAL INSTRUCTIONAL GUIDELINES

1. Assess the entry level of each student.
2. Identify the unique exit level competencies appropriate for each student.
3. Recognize the need for each student to experience success in completion of even the smallest task.
4. Use evaluation checklists to provide regular feedback to students.

5. Be flexible; use the *Program of Studies/Curriculum Guide* and *Student Workbook* to prepare your instructional plan. Modify the sequence and scope of the work skills to meet the needs of individual students.

6. Establish and use community partnerships whenever and wherever possible.

EVALUATION

Students should be provided with multiple opportunities in which to experience success. Whenever possible, teachers are encouraged to provide students with reinforcement for positive and correct behaviour. Two generic evaluation instruments, which have applicability across occupational course areas, are included in the following pages.

- Monthly Feedback and Evaluation Report
- Student Behaviour and Performance: Rating Chart.

Additional evaluation instruments may be found in each student workbook and in the *Teacher Resource Manual*.

Wherever possible, students should be encouraged to evaluate and to provide constructive feedback on their own performance and on the performance of their peers.

INTEGRATED OCCUPATIONAL PROGRAM

MONTHLY FEEDBACK AND EVALUATION REPORT

Course: ______________________ Teacher's Name: ______________________

Report for Month of: ______________________

Student's Name: ______________________ Monthly Rating: ______________________

Rating Scale: 0 – Unsatisfactory .5 – Poor 1 – Satisfactory
1.5 – Good 2 – Excellent

CRITERIA	COMMENTS	EVALUATION				
1. Attends regularly		0	.5	1	1.5	2
2. Is punctual		0	.5	1	1.5	2
3. Is prepared for work		0	.5	1	1.5	2
4. Demonstrates task commitment		0	.5	1	1.5	2
5. Develops good working relationships with others		0	.5	1	1.5	2
6. Displays a positive attitude toward subject matter		0	.5	1	1.5	2
7. Performs all duties and assignments		0	.5	1	1.5	2
8. Understands instructions and follows directions		0	.5	1	1.5	2
9. Demonstrates a professional attitude		0	.5	1	1.5	2
10. Demonstrates responsibility		0	.5	1	1.5	2

STUDENT BEHAVIOUR AND PERFORMANCE: RATING CHART

HIGH 5	MEDIUM 3	LOW 0
A. Contributes to class discussion		
1. Contributes frequently.	1. Contributes occasionally.	1. Contributes very seldom.
2. Gives good pertinent answers and suggestions.	2. Gives answers that are fairly good and relevant.	2. Wanders off topic.
3. Supports answers.	3. Cannot always support or justify answers.	3. Seldom able to support or justify decision.
B. Individually independent or resourceful		
1. Asks for little assistance until some attempt has been made to solve problem.	1. Expects considerable assistance with each problem.	1. Waits to be told what to do next.
2. Asks good questions.	2. Asks fair questions.	2. Asks poor questions.
3. Voluntarily examines reference materials.	3. Makes some use of illustrative matter and reference materials.	3. Unable to use illustrative and reference materials.
C. Demonstrates knowledge, skills and attitudes		
1. Knows the meaning of courtesy and service.	1. Needs to be reminded of the meaning of courtesy and service.	1. Doesn't know what it means to be courteous and to give service.
2. Demonstrates good service skills.	2. Demonstrates fair service skills.	2. Demonstrates poor service skills.
3. Appreciates the importance of good service.	3. Shows some appreciation for the importance of good service.	3. Shows no appreciation of good service skills.

TEACHER SUPPORT MATERIAL

AGRICULTURAL MECHANICS 16

COURSE SEQUENCE

Agricultural Mechanics 16 is the introductory course in the Agricultural Mechanics 16-26-36 sequence. This sequence is one of three occupational courses that comprise the agribusiness occupational cluster.

Agricultural Mechanics 16 enables students to explore many aspects of agricultural mechanics and its related businesses.

Students demonstrating appropriate interests, attitudes, levels of participation and basic competencies should be encouraged to complete the agricultural mechanics sequence and consider complementing it with one or more related course sequences (e.g., horticultural services, building services, construction services).

INSTRUCTIONAL LOCATIONS AND FACILITIES

The activities of this program may be experienced in a combination of the following locations:

- a classroom
- a mechanic's workshop
- a welding shop
- a carpentry shop
- a farm
- a local agribusiness or farm services and supply outlet.

Teachers are encouraged to establish, use and monitor community partners who will provide students with on-the-job instruction, under a teacher's supervision, for the majority of the Agricultural Mechanics 16 course.

The following tools and equipment are suggested for teaching Agricultural Mechanics 16. If major items of equipment are not available, the use of community partnerships is suggested.

- arc welding units and attachments
- assorted common hand and power tools
- assorted shop cleaning equipment
- compressed air supply
- exhaust extraction system
- fire safe garbage cans
- fire safe storage cabinets
- framing squares
- measuring tapes
- oxyacetylene welding units and attachments
- painting equipment
- pressure washer
- project storage area
- rope and pulley arrangements
- small engines
- soldering equipment
- solvent tanks
- supplies storage area.

OTHER LEARNING RESOURCES

Agricultural Mechanics. Oklahoma State Board of Vocational and Technical Education, 1977.

Farm Machinery Safety. Canada Safety Council.

Farm Welding (Agdex 785). Alberta Agriculture, 1985.

Grimes, L.A., Jr. *Building Maintenance Repairer*. University of Texas at Austin, 1984.

How to Read House Construction Drawings (Homedex 1700-41). Alberta Agriculture, 1985.

McDonnell, L., and A. Kaumecheiwa. *The Use of Power Tools*. Delmar Pub. Inc., 1980.

Replacing Farm Equipment (Agdex 825-18). Alberta Agriculture, 1984.

Scott, Foy, Schwendu. *Drafting Fundamentals*. Glenco Publishing Inc., 1985.

Service and Repair Instructions. Briggs and Stratton Corp., 1983.

Small Engine (Program Materials). American Association for Vocational Instructional Materials, 1979.

Small Engine Service Manual. Technical Publications Division, Intertec Publications Corporation, 1978.

South, P. *Basic Blueprint Reading*. Mississippi State University, 1983.

Trac Common Core: *Oxyacetylene Cut and Weld*. Province of British Columbia, Ministry of Advanced Education, 1978.

Vocational Agriculture I. Oklahoma State Board of Vocational and Technical Education, 1984.

Vocational Agriculture II. Oklahoma State Board of Vocational and Technical Education, 1986.

W. Weiss. *Home Maintenance* (2nd Edition). Glenco Publishing Inc., 1983.

Other related reference materials may be available from:

Agriculture Canada
Contact: Communications Branch
Agriculture Canada
930 Carling Avenue
Ottawa, Ontario K1A 0C7

Canada Safety Council
Contact: Canada Safety Council
1765 St. Laurent Blvd.
Ottawa, Ontario K1G 3V4

Farm Association Inc.
Contact: Unit 22
340 Woodlawn Road W.
Guelph, Ontario N1H 7K6

Also: Farm equipment manufacturers
Tool and equipment manufacturers.

Additional related audio-visual reference materials are available from:

ACCESS Network
Contact: ACCESS Network
16930 - 114 Avenue
Edmonton, Alberta T5M 3S2

National Film Board of Canada
Contact: 222 - 1 Street, S.E.
P.O. Box 2950, Station M
Calgary, Alberta T2P 3C3

Contact: Centennial Building
10031 - 103 Avenue
Edmonton, Alberta T5J 0G9

TEACHER SUPPORT MATERIAL

AGRICULTURAL PRODUCTION 16

COURSE SEQUENCE

Agricultural Production 16 is the introductory course in the Agricultural Production 16-26-36 sequence. This sequence is one of three occupational courses that comprise the agribusiness occupational cluster.

Agricultural Production 16 enables students to explore a major area of agribusiness. Students demonstrating appropriate interests, attitudes, levels of participation and basic competencies should be encouraged to complete the agricultural production sequence and consider complementing it with one or more related course sequences (e.g., horticultural services, agricultural mechanics).

INSTRUCTIONAL LOCATIONS AND FACILITIES

The activities of this program may be experienced in a combination of the following locations:
- in a classroom
- in a school horticultural lab
- on a farm
- in a local agribusiness or farm service and supply outlet.

Teachers are encouraged to develop, use and monitor community partners to provide students with on-the-job instruction, under a teacher's supervision, for delivery of the Agricultural Production 16 course.

The use of community resources is recommended throughout the program; both resource persons and the physical resources of the community should be considered. Physical resources may include:
- local farms
- local agribusiness (e.g., processing facilities, farm service industries, wholesale and retail operations)
- transportation and storage facilities
- marketing and auction facilities.

Health and safety should be a prime consideration in the choice of community partnerships and in the planning of partnerships. Alberta Education endorses the educational value of such activities carried out within the framework of local board approval policies, guidelines and procedures.

Community partners could include:
- farm producers
- food processing specialists
- agricultural supply agents
- district agriculturalists
- municipal district staff
- parents of students in the class.

OTHER LEARNING RESOURCES

A wide assortment of resources and resource catalogues may be obtained from the following agencies:

Agriculture Canada
Contact: Communications Branch
Agriculture Canada
930 Carling Avenue
Ottawa, Ontario K1A 0C7

(See Appendix 1 for a listing of free publications.)

Alberta Agriculture
Contact: Print Media Branch
Alberta Agriculture
7000 - 113 Street
Edmonton, Alberta, T6H 5T6
OR
Alberta Agriculture District Office

Alberta Wheat Pool
Contact: Box 2700
505 - 2 Street, S.W.
Calgary, Alberta T2P 2P5

ACCESS Network
Contact: ACCESS Network
16930 - 114 Avenue
Edmonton, Alberta T5M 3S2

Beef Information Centre
Contact: 238, 2116 - 27 Avenue, N.E.
Calgary, Alberta, T2E 7A6

Canada Safety Council
Contact: Canada Safety Council
1765 St. Laurent Blvd.
Ottawa, Ontario K1G 3V4

Crop Protection Institute of Canada
Contact: 710 - 116 Albert Street
Ottawa, Ontario K1P 5G3

Farm Safety Association Inc.
Contact: Unit 22
340 Woodlawn Road W.
Guelph, Ontario N1H 7K6

Health and Welfare Canada
Contact: Health Promotion Branch
425 - 75 Cambie Street
Vancouver, British Columbia V6B 4V5

National Film Board of Canada
Contact: 222 - 1 Street, S.E.
P.O. Box 2950, Station M
Calgary, Alberta T2P 3C3

Contact: Centennial Building
10031 - 103 Avenue
Edmonton, Alberta T5J 0G9

You can receive up to five free publications each year from Agriculture Canada. Student publications are available to schools when ordered in reasonable quantities **on school letterhead**. Orders will be filled as quickly as possible, while quantities last. Please allow four to six weeks for delivery.

Address orders to:
Communications Branch
Agriculture Canada
930 Carling Avenue
Ottawa, Ontario K1A 0C7

GENERAL

1123/E	Organization and Activities of Agriculture Canada
1296/E	Farming in Canada
1659/E	Starting a Farm in Canada
5054/E	Don't Bring It Back (folder)
5055/E	Short Films
5152/E	Canada's Agri-food System
5162/B	Technical Publications and Information from Agriculture Canada (folder)
5164/B	Agriculture Canada Priced Publications (folder)
5171/B	Helping the Agri-food Industry Grow (folder)
5184/B	Ornamental Attractions At the Central Experimental Farm (fact sheet)
5195/B	General Information on Tours – Central Experimental Farm (fact sheet)
5198/B	The Agricultural Inspection Directorate

CAREERS

5099/B	Women in Agriculture
5176/B	Women, A Driving Force in the Agri-food System (folder)
5179/B	A Career in Agricultural and Food Research (folder)
5200/E	Careers in the Agri-food System

PESTICIDES

1202/E	Control of Fabric Pests
1370/E	Control of Rats and Mice
1735/E	Insect Control in the Home
1752/E	Insect Control in the Home Garden
5128/E	Let's Talk About Pesticides (folder)
9401/E	Wood Preservatives (fact sheet)

FOOD

Home food preservation

892/E	Freezing Foods
1478/E	Home Storage Room for Fruits and Vegetables
1560/E	Canning Canadian Fruits and Vegetables
1742/E	Pickles and Relishes
1753/E	Jams, Jellies and Other Preserves
5187/E	Canning Meat At Home (fact sheet)

Meat, poultry and alternatives

1270/E	Turkey for Everyone (folder)
1317/E	Chicken Broilers (folder)
1428/E	Pork (folder)
1501/E	Canadian Lamb (folder)
1555/E	Beans, Peas and Lentils
1690/E	Meat Shopper's Guide
5167/B	Meat Inspection – Your Protection (folder)
5174/B	Economical Main Course Dishes (folder)

Milk and milk products

1622/E	Canadian Cheddar Cheese (folder)
1636/E	Canadian Cheese Guide (folder)
1648/E	Skim Milk Powder (folder)
1759/E	Making Dairy Products At Home

Fruits and vegetables

1476/E	Fresh Canadian Vegetables
1730/E	Apple Traditions the Modern Way (folder)
1735/E	All About Canadian Apples (folder)
1741/E	Potatoes Now (folder)
5172/B	Canadian Fruits and Vegetables Year Round (folder)
5173/B	Easy Gourmet Recipes with Frozen Foods (folder)

Miscellaneous

1392/E	Honey (folder)
1551/E	Cereals Anytime (folder)
1621/E	A Taste of Maple (folder)
1695/B	Food Storage in the Home (wall chart)
1707/E	Conserve Today to Consume Tomorrow
1720/E	Canada's Food Grades
1747/E	Food Shopping for One
1764/E	Feeding a Crowd Safely
5148/B	Shop Canadian Year Round (folder)
5150/B	Your Choice Counts (folder)
5175/B	Recipes with Canned Convenience (folder)

HORTICULTURE, PESTS AND DISEASES

1059/E	Home Vegetable Growing
1516/B	Gypsy Moth (folder)
1558/E	Growing Garden Tomatoes
1559/E	Growing Garden Potatoes (fact sheet)
1570/E	Canadian Havens from Hay Fever
1653/E	Container Gardening
1677/E	Growing Garden Grapes
1699/E	Poison Ivy, Western Poison Oak, Poison Sumac
1708/E	Care of Potted Flowering Plants
1718/B	Major Pests of Birch and Maple Trees (fact sheet)
1722/E	Growing Trees in Canadian Gardens
1727/B	New Winter-hardy Roses and Other Flowering Shrubs
1732/E	Care of Foliage Plants
1755/E	Coral Bells for Canadian Gardens
1762/E	Herbaceous Perennials for the Prairie Provinces
1773/B	Pruning Fruit Trees in Your Home Garden (fact sheet)

LIVESTOCK AND POULTRY

1381/E	Livestock on Small Farms
1439/E	Dairy Husbandry in Canada
1489/E	Managing a Small Poultry Flock
1524/E	Managing a Small Duck Flock
1557/E	The Registration of Animals in Canada

STUDENT PUBLICATIONS

What you should know about . . .

1350/E	Fruit Production
1412/E	Seeds
1486/E	Pollution and Agriculture (fact sheet)
1667/E	Agriculture Canada (fact sheet)

1709/E	Fertilizers
1774/E	Maple Syrup (fact sheet)
1802/E	Pest Control (fact sheet)
1803/E	Soil (factsheet)

Photographs

1616/B	Northern Agriculture
1748/B	Breeds of Poultry
1749/B	Breeds of Cattle, Horses and Swine
1750/B	Breeds of Sheep and Goats
1784/B	The Canadian Broiler Industry

A comprehensive list of learning resources related to agricultural production is contained in the following document:

Agriculture: Land and Life Teacher Resource Manual
Alberta Education, 1989 (pp. 143-153).

TEACHER SUPPORT MATERIAL

HORTICULTURAL SERVICES 16

COURSE SEQUENCE

Horticultural Services 16 is the intermediate course in the Horticultural Services 16-26-36 sequence. This sequence is one of three occupational courses that comprise the agribusiness occupational cluster.

Horticultural Services 16 enables students to explore a major area of agribusiness. Students demonstrating appropriate interests, attitudes, levels of participation and basic competencies should be encouraged to complete the sequence and consider complementing it with one or more related course sequences (e.g, agricultural production, crafts and arts).

Students with particular adeptness and interest should also be encouraged to enrol in the regular vocational Horticulture program.

INSTRUCTIONAL LOCATIONS AND FACILITIES

Schools already having a Horticulture program may wish to integrate Horticultural Services 16 in the lab with Horticulture 12. For the majority of the Horticultural Services 16 course, teachers are encouraged to establish, use and monitor community partners to provide students with on-the-job instruction under a teacher's supervision.

The course activities may occur in a combination of the following locations:
- a school horticultural lab
- the school grounds
- a school greenhouse
- a community partner's worksite (e.g., parks, florist shops, nurseries, commercial greenhouses, garden centres, botanical gardens).

The following tools and equipment are suggested for teaching Horticultural Services 16. In situations where major items of equipment are not available at the school, community partnerships are recommended.

EQUIPMENT

- aeration roller
- booster sprayer
- chain saw
- cold room
- compost bin
- electric hedge trimmer
- fertilizer spreader
- garden tractor
- greenhouse with environmental systems
- hose reels
- lawn mower
- lawn sweeper
- nylon string edge trimmer
- plant propagation equipment
- power lawn edger
- power lawn vacuum

- rototiller
- shredder
- seeding flats, trays and racks
- stepladder
- wheelbarrows.

TOOLS

- common hand tools
- cultivating hand tools
- garden forks
- garden hoses
- lawn edger
- lopping shears
- measuring cups
- pruning knives
- pruning saw/hoes
- pruning shears
- rakes
- shovels
- spray wands.

OTHER LEARNING RESOURCES

Conover, H. *Grounds Maintenance Handbook* (3rd Edition). McGraw-Hill Ryerson Limited, 1977. (Basic Learning Resource for Horticulture 12-22-32.)

McDaniel. *Floral Design and Arrangement*. Prentice-Hall Canada Inc., 1981. (Recommended Learning Resource for Horticulture 12-22-32.)

McDaniel. *Ornamental Horticulture*. Prentice-Hall Canada Inc., 1982. (Recommended Learning Resource for Horticulture 12-22-32.)

Otto, J.H., A. Towle, J.V. Bradley. *Modern Biology* (Canadian Edition). Holt, Rinehart and Winston of Canada Ltd., 1982. (Basic Learning Resource for Horticulture 12-22-32.)

Turgeon. *Turfgrass Management*. Prentice-Hall Canada Inc., 1980. (Recommended Learning Resource for Horticulture 12-22-32.)

York, B. *The Complete Family Flower and Garden Book*. Cretain Publications.

Other reference materials are available from:

Alberta Agriculture
Contact: Print Media Branch
Alberta Agriculture
9718 - 107 Street
Edmonton, Alberta T5K 2C8

OR
Contact your local Alberta Agriculture District Office.

Agriculture Canada (free publications)
Contact: Communications Branch
Agriculture Canada
930 Carling Avenue
Ottawa, Ontario K1A 0C7

Supply and Services Canada
Contact: Supply and Services Canada
Publishing Centre
Ottawa, Ontario K1A 0S9

Alberta Agriculture Film Library
Contact: Film Library
Alberta Agriculture
7000 - 113 Street
Edmonton, Alberta T5H 5T6

The following filmstrips and teacher guides are available from:

Vocational Media Associates
McIntyre Media Ltd.
30 Kelfield Street
Rexdale, Ontario
M9W 5A2

- Basics of Botany (Filmstrips No. 31092 – 127)
- Planting (Filmstrips No. 30750 – 127)
- Requirements for Health (Filmstrips No. 30753 – 127)
- Pruning (Filmstrips No. 30742 – 127)
- Propagating (Filmstrips No. 31089 – 127)
- Principles of Landscaping (Filmstrips No. 30797 – 127)
- Flower Arranging (Filmstrips No. 30752 – 127)

TEACHER SUPPORT MATERIAL

BUSINESS SERVICES 16

COURSE SEQUENCE

Business Services 16 is the introductory course in the Business Services 16-26-36 sequence. This sequence is one of two occupational courses that comprise the business and office operations occupational cluster.

Business Services 16 enables students to learn the wholesale and retail fields of businesses. Students demonstrating appropriate interests, attitudes, levels of participation and basic competencies should be encouraged to complete the business services sequence and consider complementing it with one or more related course sequences (e.g., office services, warehouse services).

Students with particular adeptness and interest should also be encouraged to enrol in the regular business education program.

INSTRUCTIONAL LOCATIONS AND FACILITIES

A merchandising lab or similar facility is desirable. Where a lab is not available, or where integration of students into regular merchandising/business education programs is not possible, the alternative of on-the-job training in the community may be considered. The teacher may wish to establish and use community partners to provide students with on-the-job training under a teacher's supervision for some of the Business Services 16 course.

RECOMMENDED FACILITIES, EQUIPMENT AND SUPPLIES FOR A BUSINESS SERVICES 16 LAB

- separate lab for typewriters and computers
- class set of electronic typewriters with dust covers
- class set of computers (CPU, monitor, keyboard) with dust covers
- one dot matrix printer for every four computers
- manual Q2, 3 or 4 switches to link computers to the printers
- class set of software appropriate to the grade being taught (check the Computer Courseware Guide produced by Alberta Education)
- adequate number of electrical outlets
- class set of posture chairs
- typewriter and computer desks (desks with hutches to hold printers are good space savers in a computer lab)
- bookstands – one per student work station
- locking filing cabinets (two per lab; one should be for storing software)

- shelving to store textbooks, supplies and small equipment such as electronic calculators
- blackboards (one per lab; preferably white boards for the reduction of dust) and bulletin boards
- paper supplies (e.g., newsprint, bond, printer paper)
- waste baskets
- general supplies and equipment for processing mail (e.g., letter opener, sorting trays, date stamp and pad)
- postage scale
- telephone line – outside line preferred
- class set of desk top electronic calculators.

INSTRUCTIONAL SUGGESTIONS

You may find the following suggestions helpful:

Job Scope

Solicit the assistance of guidance counsellors and community partners to help teach this unit. Use the current handbooks, pamphlets and brochures on careers available in your student services area and from Alberta Career Development and Employment.

Keyboarding

Where appropriate, review and encourage proper keyboarding techniques, such as correct keyboarding, posture, and machine operation. Encourage students to master the technique of touch-typing. The skills of proofreading and error correction should be reinforced whenever students are keyboarding.

There are no timed writings or drills in the student workbook. However, timings and drills may be incorporated throughout the course. Most typewriting textbooks contain a variety of one and three minute timings and various drill exercises.

The production section is not all-inclusive. Include additional exercises and other types of production work, such as handwritten and unarranged material as required.

Have students use the word processing equipment for their assignments in the keyboarding unit. Keyboarding and production can be taught on the computer, using software packages and keyboarding packages. For a list of suitable software packages, see the Reference Material section.

Writing and Spelling

This unit may be incorporated into the keyboarding unit. If the available equipment has the facility, demonstrate its ability to divide words, to spell check, etc.

Planning and Organizing

Throughout the course, students should be encouraged to do self-evaluations. The teacher should:

- use the same instrument for regular evaluation of the students
- discuss the results with the students
- discuss methods to improve identified weaknesses.

Work Standards

Arrange to have a community partner demonstrate the clothing, hairstyles, etc., that are considered appropriate in the business world.

Work Area Management

Encourage students to participate in the physical arrangement, regular cleaning, display design and methods of improving the overall working environment of their classroom/lab.

Supply Management

Tour the school's general supply room. If possible, arrange for the group under your supervision to sort and neatly arrange the supplies.

Obtain supply catalogues from retailers and wholesalers. Discuss the costs of pilfered supplies to a company and the consequences to an employee guilty of such actions.

Have students bring in samples of various office supply requisition forms. These forms vary tremendously in format and may be difficult for you alone to obtain sufficient for your purpose.

Telephone Techniques

Contact the local telephone company. Inquire about the pamphlets, tele-trainers, filmstrips, tours and information sessions it offers. Focus on the techniques, equipment and services. Role play the situations suggested in the student workbook, and incorporate actual experiences students, or people they know, have encountered.

Handling People

Provide samples of various appointment books and calendars.

Arrange to have community partners discuss procedures to use, and helpful pointers to follow when handling appointments, customers' complaints and enquiries.

Have students design a bulletin board showing examples of meeting notices and agendas.

Have hotel/motel representatives speak to the class about their role in arranging meetings, organizing groups, marketing, the hotel/motel and its services.

Filing Systems

Tour filing areas in the school (e.g., the main office, library and department rooms). Examine and discuss the means of filing and the different filing supplies and equipment.

The alphabetic filing unit in this course is limited to names of individuals. Business names and government departments could be included to enrich this unit.

Copying/Visual Communications

Visit the reprographics department of a local firm and have students report on the equipment in use. Also, consider visiting an office machine supply house or the display rooms of manufacturers or retailers of photocopiers, facsimile machines, etc., to expose students to the variety of copiers and visual communication devices.

Handling Mail

Contact Canada Post Corporation and inquire about their samples, pamphlets, class presentations and videos.

Arrange to have a local vendor demonstrate and explain mail-handling equipment. Obtain brochures from a variety of vendors regarding mail-handling equipment.

Arrange to have students visit the mail-handling facilities in a large company to observe the operations and equipment used.

In order for this unit to be presented efficiently, gather all equipment, supplies, samples and documents well in advance of instruction time.

Business Calculations

It is important for students to review the correct set-up of the work station, calculation techniques and their calculator operation before beginning this unit.

You may wish to include additional drills and application exercises.

Microcomputer Keyboarding
Southwestern Publishing
℅Gage Publishing
164 Commander Blvd.
Agincourt, Ontario M1S 3C7

Typing Tutor III
Microsoft Corporation
10700 Northup Way
Bellevue, Washington 98004

Addresses and Telephone Numbers

Alberta Government Telephones
Business Systems
8th Floor
10250 - 101 Street
Edmonton, Alberta
T5J 3P4
Telephone: (403) 493-4977

Vista 33
Museum and Viewing Gallery
AGT Tower, 33rd Floor
10250 - 101 Street
Edmonton, Alberta
Telephone: (403) 493-333

Canada Post Corporation
Customer Service
11th Floor, Phipps-McKinnon Bldg.
Edmonton, Alberta
T5J 4J4
Telephone: (403) 495-2227

Mailing Address:
9828 - 104 Avenue
Edmonton, Alberta
T5J 2T0

OTHER LEARNING RESOURCES

Farmer, Graham, Jenkins. *Personal Applications in Typewriting*. Gage Educational Publishing Company, 1976. (Good for keyboarding applications.)

Lloyd, Rowe, Winger. *Typing Power Drills*. Second Edition. McGraw-Hill Ryerson Limited, Gregg Division, 1965. (Good for reinforcing keyboard.)

Luke and Stiegler. *Office Systems and Procedures*. (Canadian Edition.) Markham, Ontario: Houghton Mifflin Canada Ltd., 1984. (Suitable for either secretarial or clerical emphasis.)

PAMPHLETS, HANDBOOKS AND BROCHURES

Career (Student Services)
- Career Trends
- Occupational Profile
- Careers Alberta
- Careers Canada: Clerical Occupations
- Canadian Classification and Directory of Occupations

Telephone (Alberta Government Telephones)
- You Are the Voice of Your Business

Mail (Canada Post Corporation)
- Packaging Tips from Canada Post
- Moving Along with the Mail
- Beyond the Basics
- How to Use the Mail
- How to Purchase Envelopes
- When You're Trying to Keep your Overhead from Becoming a Monster, Every Bit Helps . . .
- Special Delivery
- Parcel Rates within Canada
- Postal Rates within Canada
- Postal Rates to the U.S.A.
- Customer's Guide to Postal Standards and Codes
- Priority Post EMS Courier (Package)

Software

Appleworks
Apple Computer Inc.
20525 Mariani Avenue
Cupertino, California 95014

Bank Street Writer
Scholastic Inc.
123 Newkirk Road
Richmond Hill, Ontario L4C 3G5

TEACHER SUPPORT MATERIAL

OFFICE SERVICES 16

COURSE SEQUENCE

Office Services 16 is the introductory course in the Office Services 16-26-36 sequence. This sequence is one of two occupational courses that comprise the business and office operations occupational cluster.

Office Services 16 enables students to explore a major area of the business world, namely, office operations. Students demonstrating appropriate interests, attitudes, levels of participation and basic competencies should be encouraged to complete the office services sequence and consider complementing it with one or more related course sequences (e.g., business services, warehouse services).

Students with particular adeptness and interest should also be encouraged to enrol in the regular business education program.

INSTRUCTIONAL LOCATIONS AND FACILITIES

Schools that already have a business education program may wish to integrate teaching Office Services 16 with Typewriting 10. Where this is being considered, it should be noted that Office Services 16 is geared toward preparing students for the world of work, while Typewriting 10 classes serve the needs of students who are academic as well as those who wish to specialize in business training.

Where a lab is not available or where integration of students into regular business education programs is not possible, the alternative of on-the-job training in the community may be considered. The teacher may wish to establish and use community partners to provide training under a teacher's supervision for some part(s) of the Office Services 16 course. We strongly recommend that students be taught the keyboarding component of this course before they enter into a community partnership.

The student who has not been trained to touch keyboard may have limited office work available.

The following facilities, equipment and supplies are suggested when teaching Office Services 16 in a school:

- separate lab for keyboards and computers
- adequate number of electrical outlets for setting up these labs conveniently
- telephone line – outside line preferred
- locking filing cabinets (one per lab; and appropriate flex files for storing software)
- shelving to store textbooks, supplies and small equipment such as electronic calculators
- blackboards (one per lab; preferably white boards for the reduction of dust) and bulletin boards
- typewriter and computer desks (desks with hutches to hold printers are good space savers in a computer lab) and adjustable chairs
- class set of electronic typewriters with dust covers

- class set of computers (CPU, monitor, keyboard) with dust covers
- one dot matrix or NLQ (near letter quality) printer for every four computers
- manual Q2, 3 or 4 switches to link computers to the printers
- class set of software appropriate to the grade being taught (check the Computer Courseware Guide produced by Alberta Education)
- supplies (e.g., newsprint, bond, printer paper, ribbons, appropriate cleaners)
- bookstands for each lab – one per student work station
- class set of desktop electronic calculators
- access to copy equipment.

SUGGESTED ACTIVITIES

The following suggestions may be helpful when teaching Office Services 16 and when reviewing and reinforcing concepts, skills and attitudes developed in business education, Grades 8 and 9:

OFFICE EQUIPMENT AND SUPPLIES

- Tour of the school office and/or various community businesses to add realism to this unit.

KEYBOARDING

- To ensure a smooth, continuous typing style, encourage students to keep their eyes on the copy and ignore errors. Errors can be identified when assignments are complete.
- Remind students that it is common to make errors when learning a new skill and that it is OK to make mistakes. The more practice, the fewer errors.
- Cover the basic components of equipment, either typewriter or computer.
- Introduce margin setting at the start of the keyboarding section.
- The 60-space line has been used for the office business letter in the keyboarding application section because this is a common practice in the industry.
- There are no timed writings in the student workbook. However, timed writings may be incorporated while the student is learning the keyboard, and throughout the course. Most typewriting textbooks contain a variety of one and three minute timings.
- Introduce tabulation (setting tabs and use of the tab key) when the student begins to type paragraphs.

KEYBOARDING APPLICATIONS

- The correct names for the parts of a business letter should be required and reinforced when teaching the keyboarding application section.

- The keyboarding application section is not all-inclusive. Include additional exercises and other types of production work (e.g., envelopes, one- and two-page reports, multi-column tables) as required.

- Keyboarding and production can be taught on the computer, using software and keyboarding packages. It is essential that students be encouraged to type continuously and to avoid editing their copy while inputting. Errors should be identified and corrected after a piece of work is completely entered. For a list of suitable software packages, see the Reference Material section.

OFFICE TELEPHONE OPERATION

- Assign students the responsibility for answering the in-class telephone to give them practice in answering a business telephone. (Give each student one week for this activity.)

RECEPTION DUTIES

- Encourage students to observe the job activities of the school receptionist (before school, at noon hour, etc.,) and report on his or her duties.

- Initiate job shadowing opportunities in a variety of local office operations.

RECORDS MANAGEMENT

- The alphabetic filing unit is a progression of records management rules. Additional rules, or longer and more complicated activities, could be included to enrich this unit. It is recommended that individual activities be checked after each rule is taught and before a succeeding rule is introduced.

COPYING

- Basic processes of photocopying are reviewed in this unit. Depending upon the equipment available, additional activities could be included.

BUSINESS CALCULATIONS

- Additional drills and application exercises may be added to this unit.

HANDLING MAIL

- Arrange to have the school secretary demonstrate the handling and sorting of mail.

- Community partnerships will facilitate on-the-job learning of the various mail handling procedures and systems used in the workplace.

CONSUMERISM

- Newspapers, catalogues and flyers may be used to simulate, review and reinforce consumerism activities.

WORK STANDARDS

- The expectations outlined in the student workbook are common throughout the business world.

- Students should be encouraged to do self-evaluations throughout the course and compare their evaluations with those done by the teacher.

OTHER LEARNING RESOURCES

A Guideline on Office Ergonomics, National Standard of Canada CAN/CSA – 2412 – M89. Canadian Standards Association, 1989.

Farmer, Graham, Jenkins. *Personal Applications in Typewriting*. Gage Educational Publishing Company, 1976. (Good for keyboarding applications.)

Lloyd, Rowe, Winger. *Typing Power Drills* (2nd Edition). McGraw-Hill Ryerson Limited, Gregg Division, 1965. (Good for reinforcing keyboard.)

Merchant, Ronald. *Basic Business Math and Electronic Calculations* (3rd Edition). Star Publishing Co., 1983.

Rowe, Lloyd, Winger. *Typing 300 Volume One* (2nd Edition). McGraw-Hill Ryerson Limited, 1977. (Excellent when teaching the keyboard initially.)

SOFTWARE

Appleworks
Apple Computer Inc.
20525 Mariani Avenue
Cupertino, California 95014

Bank Street Writer
Scholastic Inc.
123 Newkirk Road
Richmond Hill, Ontario L4C 3G5

Microcomputer Keyboarding
Southwestern Publishing
℅Gage Publishing
164 Commander Blvd.
Agincourt, Ontario M1S 3C7

Typing Tutor III
Microsoft Corporation
10700 Northup Way
Bellevue, Washington 98004

TEACHER SUPPORT MATERIAL

BUILDING SERVICES 16

COURSE SEQUENCE

Building Services 16 is the introductory course in the Building Services 16-26-36 sequence. This sequence is one of two occupational courses that comprise the construction and fabrication occupational cluster.

Building Services 16 enables students to explore major areas of the residential and commercial construction and maintenance industry. Students demonstrating appropriate interests, attitudes, levels of participation and basic competencies should be encouraged to complete the building services sequence and consider complementing it with one or more related course sequences (e.g., construction services, maintenance and hospitality services).

Students who are particularly adept and interested may be encouraged to enrol in the regular building construction program.

INSTRUCTIONAL LOCATIONS AND FACILITIES

Schools that already have a building construction program may wish to integrate teaching Building Services 16 in the lab with a Building Construction 12-22 course.

Teachers are encouraged to establish, use and monitor community partners to provide students with on-the-job training, under a teacher's supervision, during the course.

The following tools and equipment are recommended for teaching Building Services 26. If major items of equipment are not available, the use of community partners is suggested.

EQUIPMENT

- Caulking gun
- Electric drill
- Hot tape carpet iron
- Jigsaw
- Ladders
- Level
- Power miter saws
- Power plane
- Radial arm saws
- Saw horses
- Scaffolding
- Sets of basic drafting equipment
- Table saws
- Tile cutter or diamond saw

TOOLS

- Carpet kicker
- Carpet knife
- Chisels
- Counter sink set
- Framing squares
- Hammers
- Hand saws (wood, ceramic)
- Hole saws
- Plumb bob
- Razor knives
- Tape measures
- Twist drill bits
- Wood drill bits

OTHER LEARNING RESOURCES

Alberta Building Code. Government of Alberta.

Atkinson, H.F. *Rough Carpentry and Masonry*. McGraw-Hill Ryerson Limited, 1981.

Canadian Wood Frame House Construction (Metric Edition). Canadian Mortgage and Housing Corporation, 1980. (Recommended learning resource for Building Construction 12-22-32.)

Canon and Hatby. *Building Construction Technology*. McGraw-Hill Ryerson Limited, 1982. (Recommended learning resource for Building Construction 12-22-32.)

Miller. *Building Construction – Materials and Methods*. Gage Educational Publishing Company, 1980. (Basic learning resource for Building Construction 12-22-32.)

Sutton, W. *Building Construction*. John Wiley & Sons Canada Limited.

TEACHER SUPPORT MATERIAL

CONSTRUCTION SERVICES 16

COURSE SEQUENCE

Construction Services 16 is the introductory course in the Construction Services 16-26-36 sequence. This sequence is one of two occupational courses that comprise the construction and fabrication occupational cluster.

Construction Services 16 enables students to explore major areas of residential and commercial construction and maintenance sub-trades. Students demonstrating appropriate interests, attitudes, levels of participation and basic competencies should be encouraged to complete the construction services sequence and consider complementing it with one or more related course sequences (e.g., building services, maintenance and hospitality services).

Students with particular adeptness and interest should also be encouraged to enrol in the regular building construction program.

INSTRUCTIONAL LOCATIONS AND FACILITIES

Schools that already have a building construction program may wish to integrate teaching Construction Services 16 in the lab with a Building Construction 12-22 course.

Teachers are encouraged to establish, use and monitor community partners to provide students with on-the-job training, under a teacher's supervision, during the course.

The following tools and equipment are recommended for teaching Construction Services 16. If major items of equipment are not available, the use of community partnerships is suggested.

EQUIPMENT

- Arc welding unit
- Basic drafting equipment
- Benches
- Brooms
- Compressed air
- Cut off saw
- Dust pans
- Dunk tank
- Garbage cans
- Jig saw
- Oxyacetylene welding unit
- Pedestal grinder
- Pipe threading set
- Pipe vise
- Portable circular saw
- Power hacksaw/bandsaw
- Razor knives
- Soldering iron/gun
- Welding table

TOOLS

- Conduit-bending tool
- Chipping hammer
- Files
- Framing square
- Hammers
- Hole saw set
- Levels
- Pipe cutter
- Pliers
- Plumb bobs
- Saws (wood, metal)
- Screw drivers
- Shovels
- Tape measures
- Test lights (110v)
- Welding gloves
- Welding helmet
- Wire brushes
- Wood bits

OTHER LEARNING RESOURCES

A Homecoming Guide: Permits and Wiring (87–1025) Edmonton Power.

Althouse. *Modern Welding*. General Publishing, 1984. (Basic learning resource for Welding 12-22-32.)

Betts, R.M. (editor) *Teacher's Guide for Exploring the Construction Industry.* McKnight Publishing Co., 1976.

Blankenbaker. *Modern Plumbing*. Goodheart-Wilcox, 1981. (Basic learning resource for Piping 12-22-32.)

Canadian Electric Code (15th Edition). Canadian Standards Association, 1986. (Basic learning resource for Electricity 12-22-32.)

Chasis, O.A. *Plastic Piping Systems* (Second Edition). Industrial Press Inc., 1988.

Farm Welding (Agdex 785). Alberta Agriculture.

Gasfitting Information for Residential Property Owners. Alberta Labour, Gas Protection Branch.

How to Read House Construction Drawings (Homedex 1700-41). Alberta Agriculture, 1985.

Illustrations for 1980 Alberta Plumbing and Drainage Act Regulations. Government of Alberta, 1980.

Kennedy, H.W. *Welding Technology*. Sams Publications, 1982. (Recommended learning resource for Welding 12-22-32.)

Low Energy Home Designs (Homedex 1700-71-3). Alberta Agriculture.

Meikle. *Plumbing from the Ground Up*. Holt, Rinehart and Winston of Canada Ltd., 1981. (Basic learning resource for Piping 12-22-32.)

Pender. *Welding* (Metric 3rd Edition). McGraw-Hill Ryerson Limited, 1986. (Basic learning resource for Welding 12-22-32.)

Plumbing and Drainage Act. O.C. 1284/77. Alberta Labour, Plumbing Services Branch.

School Plant Maintenance Manual. School Plant Officials Society of Alberta, 1988.

TRAC Common Core: Oxyacetylene Cut and Weld. Province of British Columbia, Ministry of Advanced Education, 1978.

Tuttle. *Fundamentals of Oxyacetylene and Arc Welding.* Pitman Publishing, 1968. (Recommended learning resource for Welding 12-22-32.)

Weiss W. *Home Maintenance* (2nd Edition). Glenco Publishing, 1983.

TEACHER SUPPORT MATERIAL

CRAFTS AND ARTS 16

COURSE SEQUENCE

Crafts and Arts 16 is the introductory course in the Crafts and Arts 16-26-36 sequence. This sequence is one of two occupational courses that comprise the creative arts occupational cluster.

Crafts and Arts 16 enables students to explore a variety of careers in the creative arts industry. Students demonstrating appropriate interests, attitudes, levels of participation and basic competencies should be encouraged to complete the crafts and arts sequence and consider complementing it with one or more related course sequences (e.g., technical arts, fashion and fabric services).

Students who are particularly adept and interested should also be encouraged to enrol in the regular visual communications vocational program.

INSTRUCTIONAL LOCATIONS AND FACILITIES

An ideal facility for Crafts and Arts 16 instruction would provide the physical resources to accommodate all of the skills identified in the Crafts and Arts 16 Profile. Laboratory/studio activities comprise the major components of the course, and these may be taught in an art room that provides:

- safe and adequate studio facilities
- ample display space
- areas for viewing and discussing craftwork and artwork in large or small groups.

Schools already possessing an art program may wish to integrate teaching Crafts and Arts 16 in the artroom with the Art 10 course. Where an art room is not available and/or where the integration of students is not possible, two alternatives are suggested:

1. use, with modifications, an existing lab/classroom, or
2. establish and use community partnerships to provide students with on-the-job instruction, under a teacher's supervision, for the majority of the Crafts and Arts 16 course.

Requirements for adopting the first alternative include the availability of facilities, tools and supplies usually associated with an art room. These may include:

Facility

• Area	– work space should be planned to accommodate a maximum of fifteen students. Overcrowding interferes with both student safety and effective teaching of the art curriculum. Storage space, in addition to work space, should be determined on a per-student basis.
• Location	– on the ground floor with access to deliveries. – a northern exposure is desirable, and the room should be isolated from regular classrooms (work noise is often a factor). – direct access to the outdoors is desirable.
• Floors	– washable surface.

- Doors – should have double doors to facilitate movement of equipment; also, two exits.
- Lighting – should have some windows and fluorescent full-spectrum lighting. Blackout facilities are essential for viewing slides, films and video.
- Ventilation – windows that open; a fume exhaust hood.
- Electrical – wiring should be 110 and 220 with several electrical outlets on different circuits.
- Electronic – all appropriate jacks and outlets for electronic media (TV, video, computer, etc.).
- Teaching and research space – library space with a work table, gallery/display areas, effective audio-visual viewing space, an area for large and small group presentations.
- Storage space – a lockable walk-in supply room with adjustable or modular storage units; also, storage shelves and cupboards beneath counters in the classroom. All storage spaces should be lockable in view of community use of workrooms. Adequate storage space should also be provided for reference materials, works of art, models, slides and reproductions.

Display Space and Furniture

Display areas should accommodate both two- and three-dimensional works of various sizes.

- Tackboard – should be in all available space.
- Display shelves – adjustable shelves mounted on brackets.
- Dropped ceiling hangers – for hanging 3-D works.
- Outside the art room – display areas (tackboards, locking cabinets) should be located in other parts of the school, especially in hallways and common areas.

Classroom Equipment and Furniture

Sufficient equipment should be provided to allow independent work on large- and small-scale projects in a variety of media. The following are basic furnishings for a high school art room:

- Sinks – two peninsulas or island units with clay traps.
- White board – minimum 1200 mm x 1200 mm.
- Bookshelves – open shelves for reference books and textbooks.
- Counter and cupboard storage – sufficient space for art paper, drawing boards and supplies, projects in progress, audio-visual materials, models, art works and reproductions.
- Steel cabinets for storing hazardous materials.
- Teacher's desk and a demonstration table.
- Filing cabinet.

- Art tables – individual student tables with tilted tops or large work tables with chairs or adjustable stools. Table-top easels for use on large work tables.
- Easels – 15 large easels for painting and presentations.
- Large paper cutter.
- Tool cabinet, with hand tools.
- Large wall screen.
- Slide projector, laserdisc player, TV monitor, computer.
- Ceramic kiln – with automatic shut-off; kiln furniture. (A kiln closet with exhaust system is recommended.)
- Garbage cans – metal for waste, plastic (with lids) for storage.
- Clean-up equipment – broom, mop and pail, sponges, scrub brushes, dustpan.
- Metal drying rack.
- First aid kit/eyewash station.
- Paper-towel dispensers.
- Workbench with vise.
- Fire extinguisher/fire blanket.

Art Materials and Tools

Ceramics

Clay – prepared
Canvas or cotton duck for tables
Modelling tools – manufactured, found objects
Glazes
Oxides
Kiln wash
Pyrometric cones
Sponges
Bamboo brushes
Plastic bags
Small plastic squeeze bottles
Plastic pails with lids for glaze storage
Kiln furniture
Rolling pin
Sieve
Heat resistant gloves
Wire clay cutters
Dipping tongs

Printmaking

Linoleum
Soft wood blocks
Carving tools
Whetstone
Printing inks (water-based)
Silkscreen fabric, frames
Solvents (note hazards)
Inking boards
Brayers
Squeegees
Drying racks or lines
Roller press (positive feed)

Sculpture and Construction

Plaster of Paris
Ceramics materials
Wire
Sandpaper
Wallpaper paste
Newspapers
Modelling clay
Straws
Sticks, toothpicks
Adhesive, tapes, glue
Found materials
Soldering and welding tools and materials
Plastic pails
C-clamps
Files
Chisels, gauges mallets, hammers
Sponges
Modelling tools (manufactured and found)
Cardboard boxes, sheets, tubes
String
Knives, utility knives

Drawing

Drawing boards
Charcoal sticks
Conte sticks
Pencils – hard and soft
Pencil crayons
India ink, coloured inks
Straight pens
Felt tip pens – fine and thick
Wax crayons
Collection of found objects
Quills or reeds
Oil and chalk pastels
Magnifying glasses
Newsprint paper
Kraft paper
Parchment
Manilla paper
Transparent paper
Drawing paper
Coloured paper
Fingerpaint paper (for felt tip pens)
Drawing erasers

Fibres

Cotton (100 percent – bleached or unbleached)
Burlap
Sewing needles and pins
Weaving needles or bodkins
Thread
Yarns, carded wool
Fabric dyes and fixatives
Batik wax
Cotton string
Fabric shears
Embroidery hoops or wooden frames
Plastic funnel
Simple frame looms
Iron
Large plastic bottles
Large plastic pails
Measuring spoons and cups
Rubber gloves
Brushes
Wax applicators
Electric fry pans
Sewing machine

Found Materials

Newspapers
Magazines
Paper bags, milk cartons
Cardboard boxes, tubes
Wood scraps, masonite
Large and small jars
Household artifacts
Styrofoam scraps
Plastic bags, bottles, pails
Roll ends from newspaper
Rags
Aluminum plates, foil plates
Egg cartons
Bones
Fabric scraps
Yarn scraps, string, rope and cord
Toothbrushes
Old kitchen utensils, spools
Clothing – costumes
Foam rubber scraps
Acoustic tile scraps
Stones
Shells
Seed pods
Dried flowers
Driftwood
Bark
Gourds

Painting

- Brushes
  - small round
  - medium round
  - large flat
  - bamboo
  - medium flat
  - assorted wide
- Mixing tray, palettes
- Paint
  - tempera (block, powder, liquid)
  - acrylic
  - watercolour
  - oil
- Primer
- Sponges
- Glass/plastic containers
- Easels
- Paper
  - manilla
  - cover
  - kraft
  - watercolour
  - Mayfair
- Painting boards (for stretching watercolour paper)
- Painting surfaces
  - canvas and wood for stretchers
  - masonite
  - found objects

Read: "Hazardous Art Materials and Occupational Safety". Art: Senior High Teacher Resource. Alberta Education, 1986. (pp. 90-114.)

Evaluation in Crafts and Arts 16

Because of the diversity of concepts, skills and attitudes that students may develop in Crafts and Arts 16, teachers are encouraged to use a variety of evaluation strategies to assess students' progress and to reinforce positive and correct behaviours. In addition to the evaluation instruments included in the Crafts and Arts 16 Student Workbook and the generic skills evaluative instrument included as part of this Teacher Resource Manual (Appendix 1, "Crafts and Arts 16 Portfolio Evaluation"), the following evaluation strategies may be used.

Portfolios: These are examples of student work selected over the length of the term or period of evaluation. The teacher can examine work for progress in the application of crafts and arts concepts, the refinement of expressive skills and the expansion of subject matter. A sample portfolio evaluation chart is attached as Resource 1.

Anecdotal Records: Teachers may keep charts, checklists and brief notes about students' work habits, attitudes, understanding, contribution to discussions and application of information. Such observational notes are valuable evaluation tools.

Written Assignments: A range of written assignments are included in the student workbook. Discussion and research skills are developed as a component of many of these written assignments.

Oral Participation: Student activities identified in the student workbook include both discussion and brainstorming activities. Each student should be encouraged to participate as a member of small group discussions and other activities as well as whole-class oral activities.

Tests: Written tests, quizzes and recognition tests are appropriate for many of the concepts, skills and attitudes in the course. They provide useful summative evaluation information, particularly where processes of craft making, art making and vocabulary are involved.

OTHER LEARNING RESOURCES

An extensive list of print, visual and audio-visual resources may be found in the following documents:

- Art: Senior High Teacher Resource. Alberta Education, 1986. (pp. 54-89.)
- Art 10-20-30 Curriculum Guide. Alberta Education, 1986. (p. 5.)

CRAFTS AND ARTS 16

PORTFOLIO EVALUATION

Name: ____________ Class: ____________ Date: ____________

Requirements of Assignment

______ All required examples of work included? ____________.

______ Work is signed, dated, presented according to requirements.
Comment: ____________

______ Subject matter rendered in a variety of media, techniques.
Comment: ____________

Growth

______ Work shows growth in skill and confidence over the period of assignment.
Comment: ____________

______ Finds own ideas for creating and expressing subject matter.
Comment: ____________

______ Uses media effectively.
Comment: ____________

______ Refines, modifies ideas to suit medium, problem.
Comment: ____________

Summary Assessment

Student: ____________ Teacher: ____________

TEACHER SUPPORT MATERIAL

TECHNICAL ARTS 16

COURSE SEQUENCE

Technical Arts 16 is the introductory course in the Technical Arts 16-26-36 sequence. This sequence is one of two occupational courses that comprise the creative arts occupational cluster.

Technical Arts 16 enables students to explore career areas in the creative and graphic arts industries. Students demonstrating appropriate interests, attitudes, levels of participation and basic competencies should be encouraged to complete the technical arts sequence and consider complementing it with one or more related course sequences (e.g., technical arts).

Students with particular adeptness and interest should also be encouraged to enrol in the regular vocational visual communications or graphic arts programs.

INSTRUCTIONAL LOCATIONS AND FACILITIES

Schools that already have a visual communication or graphic arts program may wish to integrate the teaching of Technical Arts 16 in the lab along with the Vocational 12-22 course.

Teachers are encouraged to establish, use and monitor community partnerships that will provide students with on-the-job training or experience during the course.

The following tools and equipment are recommended for teaching Technical Arts 16. If major items of equipment are not available, the use of community partners is suggested.

Graphic Arts

A suitable area with appropriate equipment for designing, laying out and producing graphic communication samples. Equipment should include:

- typesetting machine
- layout and design tools and equipment
- duplicating, printing or computer equipment.

Photographic Arts

A suitable area to take photographs, develop the film, make prints with darkroom enhancement techniques and mount prints on card stock. Equipment should include:

- process camera
- a variety of cameras
- studio lighting for portraiture
- photographic studio equipment
- film processing equipment
- darkroom equipment
- suitable storage areas for paper, film and chemicals
- mounting equipment.

Media Arts

A suitable area with appropriate equipment to create video, television or stage productions. The equipment should include:

- a variety of lighting equipment
- audio-visual equipment
- set construction tools and equipment.

OTHER LEARNING RESOURCES

Biegeleisen, J.I. *Design and Print Your Own Posters.* Watson-Guptil, 1980.

Broekhuizen, Richard J. *Graphic Communications* (McKnight). Collier MacMillan Canada, Inc., 1979.

Cogoli. *Photo-Off Set Fundamentals* (5th Edition). Collier MacMillan Canada Inc., 1986. (Basic learning resource for Visual Communications 12-22-32.)

Hendry, William J. *Introduction to 12 Graphic Arts.* McGraw-Hill Ryerson, Ltd., 1987.

Hird, Kenneth F. *Understanding Graphic Arts.* Gage Educational Publishing Company, 1982. (Approved recommended learning resource for Graphic Arts 12-22-32.)

Kagy, Frederick D. *Graphic Arts.* Goodheart-Willcox. 1981.

Langford, Michael. *The Single Lens Reflex Handbook.* Knof, 1983.

Walker, Richard, and Robert E. Walker. *Exploring Photography.* Goodheart-Willcox, 1983.

TEACHER SUPPORT MATERIAL

NATURAL RESOURCE SERVICES 16

COURSE SEQUENCE

Natural Resource Services 16 is the introductory course in the Natural Resource Services 16-26-36 sequence. This sequence has been developed as one of three occupational areas: mining, forestry, oil and gas.

Natural Resource Services 16 enables students to explore three of Alberta's major natural resource industries. Students demonstrating appropriate interests, attitudes, levels of participation and basic competencies should be encouraged to complete the natural resource services sequence and consider complementing it with one or more related course sequences (e.g., agricultural mechanics, warehouse services, building services, construction services).

INSTRUCTIONAL LOCATIONS AND FACILITIES

Few schools possess the facilities and equipment to provide "on-campus" instruction in Natural Resource Services 16. In jurisdictions where a similar course has been offered, the most effective learning experiences were facilitated through the development of school-community partnerships with one or more local operations.

Teachers are encouraged to establish, use, and monitor community partnerships that will provide students with on-the-job training or experiences during the course.

OTHER LEARNING RESOURCES

Forestry

Farming Canada's Forest. Forest Management and Silviculture. Canadian Pulp and Paper Association, Quebec.

Forestry. Alberta Correspondence School, Alberta Education, 1975.

Lash, G.H. *A Walk in the Forest.* Canadian Pulp and Paper Association, Quebec.

Managing the Forest. Western Educational Development Group. Faculty of Education, University of British Columbia, 1985.

Other teacher resources related to forestry and the pulp and paper industry may be obtained from:

Alberta Forest Service Information Centre
9920 - 108 Street
Edmonton, Alberta
T5K 2M4
(427-3590)

or 703 - 6 Avene, S.W.
Main Floor
Calgary, Alberta
T2P 0T9
(297-6324)

The Canadian Pulp and Paper Association
23rd Floor, Sun Life Building
1155 Metcalfe Street
Montreal, Quebec
H3B 2X9

Northern Forest Research Centre
Canada Forestry Service
Environment Canada
5320 - 122 Street
Edmonton, Alberta
T6H 3S5

The Alberta Forestry Association
311 Alberta Block
10526 - Jasper Avenue
Edmonton, Alberta
T5J 1Z7

Oil and Gas

A Guide to Business Opportunities in the Oil and Gas Industry in Northern Alberta. Northern Alberta Development Council.

Drilling Rig Task Details and Performance Standards for the Floorhand. Canadian Association of Oil Well Drilling Contractors, 1981.

Gerding, M. (editor) *Fundamentals of Petroleum* (3rd Edition). Petroleum Extension Service, The University of Texas at Austin, 1986.
(This teacher resource and others are available from:
Petroleum Industry Training Services
Bay 13, 2115 - 27 Avenue, N.E.
Calgary, Alberta)

Introduction to Oil and Gas Production. American Petroleum Institute, Dallas, Texas.

McRory, R.E. *Energy Alberta. Oil Sands and Heavy Oils of Alberta.* Alberta Energy and Natural Resources, 1982.

Oil Sands and Heavy Oils of Alberta. Alberta Energy and Natural Resources.

Our Petroleum Challenge – The New Era. The Petroleum Resources Communication Foundation, Calgary, Alberta.

Training Planning Guide. Petroleum Industry Training Service, 1988-89.

Other materials are available from:

Alberta Community and Occupational Health
10030 - 107 Street
Edmonton, Alberta
T5J 3E4

Mining

Alberta Coal: Energy for the World. Office of Local Research and Technology, Alberta Energy.

Mining. What Mining Means to Canada. The Mining Association of Canada, 1977.

Other materials are available from:

The Coal Association of Alberta
Suite 301, 1000 Eight Avenue, S.W.
Calgary, Alberta
T2P 3M7

TEACHER SUPPORT MATERIAL

CHILD AND HEALTH CARE SERVICES 16

COURSE SEQUENCE

Child and Health Care Services 16 is the intermediate course in the Child and Health Care Services 16-26-36 sequence. This sequence has been developed as one of four occupational courses that comprise the personal and public services occupational cluster.

Child and Health Care Services 16 enables students to explore career areas of the child and health care industries. Students demonstrating appropriate interests, attitudes, levels of participation and basic competencies should be encouraged to complete the child and health care services sequence and consider complementing it with one or more related course sequences.

Students with particular adeptness and interest should be encouraged to enrol in the regular vocational health services program.

ENTRANCE REQUIREMENT

Students taking Child and Health Care Services 26 must have completed satisfactorily Child and Health Care Services 16 or an equivalent course.

INSTRUCTIONAL LOCATIONS AND FACILITIES

Schools already possessing a health services program may wish to integrate teaching Child and Health Care Services 16 in the same area. Where a lab is not available and/or where the integration of students is not possible, three alternatives are suggested for the instruction of skills:

1. Use, with minor modification, an existing lab/classroom.
2. Use the home economics lab area.
3. Establish and use community partnerships to provide students with on-the-job instruction under a teacher's supervision.

Major requirements for adopting the first alternative include the availability of:

- suitable sink and hot/cold water facilities
- sanitary and secure storage areas
- homelike set-up.

Basic child care supply items include:

- crib
- infant seat
- high chair
- cloth diapers and pins
- disposable diapers
- dolls
- baby bottles and nipples.

Adult health care supply items include:

- daybed or sofa.

First aid supply items include:

- selection of bandages
- basic first aid kit.

Nutrition supply items include:

- stove
- refrigerator
- table and chairs
- cooking utensils
- dishes.

Homemaking supply items include:

- washer
- dryer
- cleaning supplies
- cleaning equipment.

OTHER LEARNING RESOURCES

Forestry

Averbach, Stevanne. *The Whole Child.* G.P. Putnam and Sons, New York, 1981.

Canada's Food Guide Handbook. Health and Welfare Canada, 1982.

Child's Body, A Parent's Manual. Paddington Press Ltd., New York and London, 1977.

Howe, Phyllis. *Basic Nutrition in Health and Disease.* W.B. Saunders Company, 1981.

Huber, H., Spatz, A., C. Coviello. *Homemaker/Home Health Aide.* Delmar Publishers Inc., New York, 1985.

Illerbrun, Marley. *Long-Term Care Aide and Homemaker.* Minister of Education, Province of British Columbia, 1984.

Kaluger, George, Meriem Kaluger. *Human Development, the Span of Life.* C.V. Mosby Company, 1979.

St. John Ambulance. *The Complete Handbook of Family Health Care.* St. John Priory of Canada Properties, 1984.

St. John Ambulance. *First Aid Safety Oriented,* 1987.

Zucker, Elana. *Being a Homemaker and Home Health Aide.* Robert J. Brady Co., 1982.

TEACHER SUPPORT MATERIAL

ESTHETOLOGY 16

COURSE SEQUENCE

Esthetology 16 is the introductory course in the Esthetology 16-26-36 sequence. This sequence has been developed as four occupational courses that comprise the personal and public services occupational cluster.

Esthetology 16 enables students to explore a major area of the personal service industry. Students demonstrating appropriate interests, attitudes, levels of participation and basic competencies should be encouraged to complete the esthetology sequence and consider complementing it with one or more related course sequences (e.g., hair care, business services).

Students with particular adeptness and interest should be encouraged to enrol in the regular vocational beauty culture program.

INSTRUCTIONAL LOCATIONS AND FACILITIES

Schools already possessing a beauty culture program may wish to integrate teaching Esthetology 16 in the beauty culture lab with the Beauty Culture 12 course. Where a lab is not available and/or where the integration of students is not possible, two alternatives are suggested:

- Use, with minor modifications, an existing lab/classroom
- Establish and use community partnerships to provide students with on-the-job instruction under a teacher's supervision for the majority of the Esthetology 16 course.

Major requirements for adopting the first alternative include the availability of:

- suitable sinks and hot/cold water facilities
- two adjacent electrical outlets for each student in the course
- suitable sanitary aids common to a beauty shop or lab (e.g., washer, dryer, sanitary and secure storage areas)
- facial equipment, chairs, tables, operator's stool
- wall or table mounted magnifying mirror
- basic tools, implements and supply items suitable for facial/nail use.
- facial cosmetics.

The estimated equipment, tools and supply needs for each student in Esthetology 16 are:

- facial chairs or reclining hydraulic chairs
- capes, towels
- sanitary paper towels
- tweezers
- cuticle scissors
- orangewood sticks
- cotton – other manicure equipment
- assorted supplies for plain facial, plain manicure, plain pedicure
- materials for false lash application
- assorted nail supplies.

OTHER LEARNING RESOURCES

Colletti, Anthony B. *A Complete Question and Answer Guide to Hairdressing and Cosmetology*. Keystone Publications, 1978.

Dalton, John W. *The Professional Cosmetologist* (3rd Edition). West Publishing Company, 1983.

Picard Villa, Louis. *Cosmetology. The Art of Making Up.* Gage Educational Publishing Company, 1987.

Gerson, Joel. *Standard Textbook for Professional Estheticians.* Milady Publishing Corp., 1983.

TEACHER SUPPORT MATERIAL

FASHION AND FABRIC SERVICES 16

COURSE SEQUENCE

Fashion and Fabric Services 16 is the intermediate course in the Fashion and Fabric Services 16-26-36 sequence. This sequence has been developed as one of four occupational courses that comprise the personal and public services occupational cluster.

Fashion and Fabric Services 16 enables students to explore a major area of the personal and public services industry. Students demonstrating appropriate interests, attitudes, levels of participation, and basic competencies should be encouraged to complete the fashion and fabric services sequence and consider complementing it with one or more related course sequences (e.g., business services, hair care).

Students with particular adeptness and interest should be encouraged to enrol in the regular clothing and textile program.

INSTRUCTIONAL LOCATIONS AND FACILITIES

Schools already possessing a clothing and textiles program may wish to integrate teaching Fashion and Fabric Services 16 in the lab with the Clothing and Textiles 10 course. Where a lab is not available and/or where the integration of students is not possible, two alternatives are suggested:

1. Use, with minor modifications, an existing lab/classroom and complement in-class instruction with a considerable number of community partnerships especially in the area of fabric cleaning.
2. Establish and use community partnerships to provide students with on-the-job instruction, under a teacher's supervision, for the majority of the course.

OTHER LEARNING RESOURCES

Ashburn, Alice B. *Fashion and Fundamentals*. Extension, Instruction and Materials Centre, The University of Texas at Austin, 1984. (An answer book is also available.)

Complete Guide to Sewing. Reader's Digest Association (Canada) Ltd., 1979.

Friend, Cathy; Parker, Frances; and Jeanette Weber. *Clothing: Fashion, Fabrics, Construction*. Teacher's Manual. Bennett and McKnight, 1986.

Graef, J.R., and J.B. Strom. *Concepts in Clothing* (1st Canadian Edition). McGraw-Hill Ryerson Limited, 1979.

Kefgen, M., and P. Touchie-Specht. *Individuality in Clothing Selection and Personal Appearance* (3rd Edition). Collier Macmillan Canada, Inc., 1981.

Lopez, Karen; Richmond, Mary; and Ramona Rowan. *Clothing: Fashion, Fabrics, Construction*. Teacher's Resource Book. Bennett and McKnight, 1986.

Weber, Jeanette. *Clothing: Fashion, Fabrics, Construction*. Bennett and McKnight, 1986.

Various brochures, booklets and other information may be obtained from:

Alberta Consumer and Corporate Affairs
3rd Floor, Capilano Centre
9945 – 50 Street
Edmonton, Alberta
T6A OL4
Telephone: (403) 427-5782

Mailing Address:
Box 1616
Edmonton, Alberta
T5J 2N9

Alberta Professional Dry Cleaner's Association
P.O. Box 1048
Red Deer, Alberta
T4N 6S5
(The telephone number of the association's president will change each year. Contact should be made through a local drycleaning operation.)

Alberta Safety Council
201, 10526 Jasper Avenue
Edmonton, Alberta
T5J 1Z7
Telephone: (403) 428-7555

(Both the Alberta and the Canada Safety Councils provide safety information in the areas of:
- Drycleaning and pressing
- Spotting or spot removing
- Pressing or garment finishing
- Safety of auxiliary drycleaning employees
- Use of sewing machines, tools
- Fabric testing, cleaning and repairs.

Canadian Cleaner and Launderer
P.O. Box 968
Oakville, Ontario
L6J 5E8
Telephone: (416) 825-2415

Consumer and Corporate Affairs Canada
Edmonton District Office
10225 – 100 Avenue
Edmonton, Alberta
T5J 0A1
Telephone: (403) 420-2485

DOW Chemical Company
Modelind Road,
P.O. Box 1012
Sarnia, Ontario
N7T 7K7

Brochures available include:
- Drycleaning: A Basic Handbook
- How to Get Along with Your Solvent
- Safety is Good Business, Make it a Part of Yours.

International Fabric Care Institute
12251 Tech Road
Silver Springs, Maryland U.S.A. 20904
Telephone: (301) 622-4807

Textile Analysis Service
Room 315
Printing Services Building
University of Alberta
Edmonton, Alberta
T6G 2N1
Telephone: (403) 492-3832

EDUCATIONAL KITS

The Butterick Sewing Series: A Complete Multimedia Learning Experience. New York, New York: Butterick Publishing, 1977.

What Everyone Should Know About Fabrics. Kildeer, Illinois: The Learning Seed, 1985.

Discovering Fibers and Fabrics. New York, New York: Butterick Publishing, 1976.

Fabric Science (4th Edition). New York, New York: Fairchild Publications, 1983.

TEACHER SUPPORT MATERIAL

HAIR CARE 16

COURSE SEQUENCE

Hair Care 16 is the introductory course in the Hair Care 16-26-36 sequence. This sequence has been developed as four occupational courses that comprise the personal and public services occupational cluster.

Hair Care 16 enables students to explore a major area of the personal services industry. Students demonstrating appropriate interests, attitudes, levels of participation and basic competencies should be encouraged to complete the hair care sequence and consider complementing it with one or more related course sequences.

Students with particular adeptness and interest should be encouraged to enrol in the vocational beauty culture program.

INSTRUCTIONAL LOCATIONS AND FACILITIES

Schools already offering a beauty culture program may wish to integrate teaching Hair Care 16 in the beauty culture lab with the Beauty Culture 12 course. Where a lab is not available and/or where the integration of students is not possible, two alternatives are suggested:

1. Use, with minor modifications, an existing lab or classroom.
2. Establish and use community partners to provide students with on-the-job instruction, under a teacher's supervision, for the majority of the Hair Care 16 course.

Major requirements for adopting the first alternative include the availability of:

- suitable sinks and hot and cold water facilities
- two adjacent electrical outlets for each student in the course
- suitable sanitary aids common to a beauty shop or lab (e.g., washer, dryer, sanitary and secure storage areas)
- wall mounted or self-supporting table mirrors
- suitable tables at wall stations that will hold clamp-type mannequin stands
- basic tools and hair and beauty supply items.

The estimated equipment, tools and supply needs for each student in Hair Care 16 are:

- setting mannequin and stand
- 4 dozen assorted rollers
- 1 box of roller clips
- curling iron (professional grip)
- blow-dryer (1200 watts)
- nylon or plastic cape
- 4 towels
- 2 setting combs
- 1 tail comb
- 1 detangler
- assorted chemicals (e.g., shampoos, rinses, conditioners, hydrogen peroxide, permanent waving lotion)
- 1 pair of haircutting scissors

- assorted hair goods (e.g., human hair, synthetic fibre wigs, hairpieces)
- Nitrazene paper (i.e., pH testing strips or rolls).

OTHER LEARNING RESOURCES

Colletti, Anthony B. *A Complete Question and Answer Guide to Hairdressing and Cosmetology*. Keystone Publications, 1978.

Dalton, John W. *The Professional Cosmetologist* (3rd Edition). West Publishing Co., 1983. (Authorized Text.)

Manfredonia, Salvatore J. *28 Styles for Student Practice*. Milady Publishing Corp., 1983.

Simpson, Sim, ed. *Curling Irons*. Milady Publishing Corp., 1969.

TEACHER SUPPORT MATERIAL

COMMERCIAL FOOD PREPARATION 16

COURSE SEQUENCE

Commercial Food Preparation 16 is the introductory course in the Commercial Food Preparation 16-26-36 sequence. This sequence has been developed as one of three occupational courses that comprise the tourism and hospitality occupational cluster.

Commercial Food Preparation 16 enables students to explore a major area of the tourism and hospitality industry. Students demonstrating appropriate interests, attitudes, levels of participation and basic competencies should be encouraged to complete the commercial food preparation sequence and consider complementing it with one or more related course sequences (e.g., food services, business services).

Students with particular adeptness and interest should be encouraged to enrol in the regular vocational food preparation program.

INSTRUCTIONAL LOCATIONS AND FACILITIES

Schools already offering a food preparation program may wish to integrate teaching Commercial Food Preparation 16 in the cafeteria or lab with the food preparation course. Where a lab is not available and/or where the integration of students is not possible, two alternatives are suggested:

1. Use, with minor modifications, an existing home economics lab.

2. Establish and use community partnerships to provide students with on-the-job instruction, under a teacher's supervision, for the majority of the Commercial Food Preparation 16 course.

Teachers are encouraged to establish, use and monitor community partnerships to provide students with on-the-job experiences during the course.

The following tools and equipment are recommended for teaching Commercial Food Preparation 16. If major items of equipment are not available, the use of community partners is suggested.

- Commercial-style kitchen containing:
  - sets of basic kitchen utensils, implements and equipment suitable for commercial cutting, chopping, spreading, serving, measuring, mixing, etc.
  - grills, stoves and ovens for cooking and baking commercial quantities of food
- Suitable storage for food products and supplies
- Cleaning and sanitation equipment
- Serving dishes and utensils.

OTHER LEARNING RESOURCES

Canada Food Guide Handbook (Revised), 1982.

This is a multimedia set of six videotapes and support materials. The following topics are addressed:

- food delivery and storage
- food preparation
- personal hygiene
- temperature control
- pest control
- basic cleaning.

Catering with Care: Health, Hygiene and Safety
Available from:
Filmwest Associates
10619 - 124 Street
P.O. Box 11028
Edmonton, Alberta
T5J 3K3

Food Production, Management and Services. Mid-America Vocational Consortium, Stillwater, Oklahoma.

Food Preparation: Basic Guidelines for Baking, Frying and Salads. Proctor and Gamble Educational Series, Toronto, Ontario, 1982.

Marsh, B. *Professional Cookery.* McGraw-Hill Ryerson Limited, 1985.

Public Health Act, Food Regulation. Province of Alberta.

Ray, M.F., and B.A. Dondi. *Professional Cooking and Baking.* Glenco Publishing, 1981.

The following learning resources are published to support this text:

- Recipe File, M.F. Rey, 1981
- Student Activity Guide, 1981
- Student Workbook, 3rd Edition, 1988
- Teacher Resource Guide, 3rd Edition, 1988.

Wattie, H., and E.D. Whyte. *Canadian Cookbook (SI Metric Edition),* McGraw-Hill Ryerson Limited, 1977.

TEACHER SUPPORT MATERIAL

FOOD SERVICES 16

COURSE SEQUENCE

Food Services 16 is the introductory course in the Food Services 16-26-36 sequence. This sequence has been developed as one of three occupational courses that comprise the tourism and hospitality occupational cluster.

Food Services 16 enables students to explore a major area of the tourism and hospitality industry. Students demonstrating appropriate interests, attitudes, levels of participation and basic competencies should be encouraged to complete the food services sequence and consider complementing it with one or more related course sequences (e.g., commercial food preparation, business services).

Students with particular adeptness and interest should be encouraged to enrol in the regular vocational food preparation program.

INSTRUCTIONAL LOCATIONS AND FACILITIES

Schools already having a food preparation program may wish to integrate teaching Food Services 16 in the cafeteria and lab with the Food Preparation 12 course. Where a lab is not available and/or where the integration of students is not possible, the alternatives are:

1. Use, with minor modifications, an existing kitchen area, food lab, classroom, staff dining room/lounge. Major requirements for adopting this alternative include the availability of:
    - suitable space to create various types of food service layouts
    - tables and chairs to run facility
    - suitable sink, cloakroom, changing room
    - sidestand or equivalent
    - basic supply of tableware--dishes, flatware, glassware
    - basic supply of serving equipment, tools and supplies
    - cash register or cash drawer.
2. Establish and use community partners to provide students with on-the-job instruction, under a teacher's supervision, for the majority of the Food Services 16 course.

OTHER LEARNING RESOURCES

Catering with Care: Health, Hygiene and Safety
Available from:
Filmwest Associates
10619 - 124 Street
P.O. Box 11028
Edmonton, Alberta
T5J 3K3

This is a multimedia set of six videotapes and support materials that focus on:

1. Food delivery and storage
2. Food preparation
3. Personal hygiene
4. Temperature control
5. Pest control
6. Basic cleaning.

Food and Beverage Service. (Instructor's Guide.) Educational Institute of the American Hotel and Motel Association.

Food Production, Management and Services. Mid-America Vocational Consortium, Stillwater, Oklahoma.

Public Health Act, Food Regulation. Province of Alberta.

Travel Alberta, Edmonton, Alberta (telephone (403) 427-7612). Films, tapes and other materials may be available.

TEACHER SUPPORT MATERIAL

MAINTENANCE AND HOSPITALITY SERVICES 16

COURSE SEQUENCE

Maintenance and Hospitality Services 16 is the introductory course in the Maintenance and Hospitality Services 16-26-36 sequence. This sequence is one of three occupational courses that comprise the tourism and hospitality occupational cluster.

Maintenance and Hospitality Services 16 enables students to explore a major area of the tourism and hospitality industry. Students demonstrating appropriate interests, attitudes, levels of participation, and basic competencies should be encouraged to complete the maintenance and hospitality services sequence and consider complementing it with one or more related course sequences (e.g., food services, building services, construction services).

INSTRUCTIONAL LOCATIONS AND FACILITIES

Where a maintenance and hospitality lab is not available and/or where the integration of students into a similar program is not possible, three alternatives are suggested:

1. Use caretaking resources (equipment, tools, supplies) in the school.
2. Use, with minor modifications, an existing home economics lab.
3. Establish and use community partnerships to provide students with on-the-job instruction, under a teacher's supervision, for the majority of the Maintenance and Hospitality Services 26 course.

Major requirements for adopting the first alternative include the availability of:

- suitable sink facilities
- sufficient electrical outlets to run a number of machines
- proper storage areas
- basic equipment, tools and supplies for Maintenance and Hospitality 16.

The suggested equipment, tools and supplies for Maintenance and Hospitality 16 are:

EQUIPMENT

- Chalkboard
- Chemical storage area and cabinet
- Garbage bins
- Garbage cans
- Garbage receptacles
- Ladders
- Power floor machines
- Pressure washer
- Utility carts
- Vacuum cleaners
- Wet-floor signs

SUPPLIES

- Chalk
- Chemical cleaners
- Chemical disinfectants
- Electrical tape
- Extension cord parts
- Garbage cans
- Pressure washer soap
- Rags

TOOLS

- Assorted hand tools
- Brooms
- Brushes
- Carpet and upholstery cleaning equipment
- Chalk brushes
- Dust mop tray
- Dustpans
- Floor squeegees
- Mops (floor, finish, dust, wet)
- Pads (stripping, abrasive, polishing)
- Pails with wringer attachments
- Plumbing augers
- Safety glasses/face shields
- Sponges
- Tape measures
- Toilet plunger
- Vinyl aprons
- Vinyl gloves
- Window squeegees

OTHER LEARNING RESOURCES

Betts, R.M., ed. *Teacher's Guide for Exploring the Construction Industry*. McKnight Publishing Company, 1976.

Gellnev, S., ed. *Do It Yourself Flooring* (1st Edition). Lane Publishing, 1982.

Griflin, W.R. *Comprehensive Custodial Training Manual*. Cleaning Consultant Services Inc., Seattle, Washington, 1985.

School Plant Maintenance Manual. School Plant Officials Society of Alberta, 1988.

Smith, E.R. *Custodial Curriculum*. Curriculum Development Project, Final Report, Renton Vocational Technical Institute, 1986.

Vandervort, D.W., ed. *Basic Carpentry*. (1st Edition). Lane Publishing, 1972.

Weiss, W. *Home Maintenance* (2nd Edition). Glenco Publishing, 1983.

Wilks, G., M. Stokes. *Building Service Worker Curriculum for Special Needs Students*. Alberta Vocational Centre, 1987.

Instructional Safety Objectives. FW Vocational/Technical Training Courses. Canada Safety Council.

Other resource materials are available from:

Alberta Workers' Health, Safety and Compensation
Contact: Occupational Hygiene Branch Offices:
9321 - 48 Street
Edmonton, Alberta
T6B 2R4
(403) 427-4792

2nd Floor, 1021 - 10 Avenue, S.W.
Calgary, Alberta
T2R 2B7
(403) 261-2188

Health and Welfare Canada
Contact: Health Protection Branch
Health and Welfare Canada
Ottawa, Ontario
K1A 1B4

TEACHER SUPPORT MATERIAL

AUTOMOTIVE SERVICES 16

COURSE SEQUENCE

Automotive Services 16 is the introductory course in the Automotive Services 16-26-36 sequence. This sequence is one of three occupational courses that comprise the transportation occupational cluster.

Automotive Services 16 enables students to explore a major area of the transportation industry. Students demonstrating appropriate interests, attitudes, levels of participation and basic competencies should be encouraged to complete the automotive services sequence and consider complementing it with one or more related course sequences (e.g., service station services, agricultural mechanics, warehouse services).

Students with particular adeptness and interest should be encouraged to enrol in the regular vocational automotives program.

INSTRUCTIONAL LOCATIONS AND FACILITIES

Schools already having an automotives program may wish to integrate teaching Automotive Services 16 in the automotives lab with the vocational automotives courses. Teachers are encouraged to establish and use community partners to provide students with on-the-job instruction, under a teacher's supervision, for the majority of the Automotive Services 16 course.

Automotives Services 16 should be taught in a lab or shop designed for automotives work, and, a suitably qualified teacher and/or supervisor should be available to direct the learning process and to ensure that necessary safety practices are followed.

Basic equipment suggested for Automotive Services 16 include:

EQUIPMENT

- Air compressor
- Carburetor mounting fixture
- Engine stand
- Floor jack
- Hoist
- Oil drain mobile
- Pressure washer
- Safety stands
- Tire balancer
- Tire changer
- Tire tank
- Vacuum cleaner
- Waste oil storage tank

TOOLS

- 0-1 in. imperial outside micrometre
- 0-25 mm metric outside micrometre
- Bleeding bottle and hose
- Brake-tool sets
- Car wash brusher
- Compressor testo
- Cooling system pressure tester kit
- Grease gun
- Oil pressure test kit
- Ratchet and socket sets
- Screwdriver sets
- Vacuum tester kit
- Wrench sets

AUDIO-VISUAL

- Overhead projector
- Overhead transparencies
- Projection screen

PRINTED MATERIAL

- Assorted automotive textbooks
- Automotive parts charts
- Shop reference set
- Parts books

COMPONENTS AND SAMPLES

- Carburetors
- Disc brake unit
- Engine parts
- Engine samples
- Fastener sample kit
- Front drum brake unit w/o adjusting mechanism
- Measuring sample kit
- Rear bendix brake unit
- Rims
- Tires

OTHER LEARNING RESOURCES

Alley, Walter and Billiet Walter. *Disc and Drum Brake Service* (2nd Edition). American Technical Society, 1974.

Barbarossa, Fred. *The Car Care Book* (1st Edition). South-Western Publishing, 1983.

Crouse, William. *Automotive Mechanics* (2nd Canadian Edition). McGraw-Hill Ryerson Limited, 1987. (Approved basic learning resource for automotives.)

Crouse, William. *Automotive Service Business* (1st Edition). McGraw-Hill Ryerson Limited, 1973.

Disc Brake Manual (#9424). Ammco Tools Inc.

Hoyt, Wade, and Ian Walter, ed. *Complete Car Care Manual* (1st Edition). The Readers' Digest Association, 1981.

Kelley, Lee (ed.). *Basic Automotive Tune Up and Test Equipment*. Petersen Publishing, 1977.

Nash, Frederick C. *Automotive Technology* (3rd Edition). McGraw-Hill Ryerson Limited, 1986.

Stockel, Martin. *Auto Mechanics Fundamentals* (3rd Edition). Goodheart-Wilcox, 1978.

Stockel, Martin. *Auto Service and Repair* (3rd Edition). Goodheart-Wilcox, 1978.

Thiessen, Frank and Dales, Davis. *Automotive Principles and Service* (2nd Edition). Prentice Hall Canada Inc., 1984. (Approved basic learning resource for automotives.)

Thiessen, Frank, and Dales Davis. *Automotive Principles and Service Study Guide and Workbook* (1st Edition). Reston Publishing, 1981.

Other reference materials include:

Automotive Accessories and Supply Catalogues
Automotive/Industrial Supply House Catalogues
Automotive Periodicals
Automotive Tool and Equipment Supply House Catalogues
Telephone Advertising Directories.

TEACHER SUPPORT MATERIAL

SERVICE STATION SERVICES 16

COURSE SEQUENCE

Service Station Services 16 is the introductory course in the Service Station Services 16-26-36 sequence. This sequence is one of three occupational courses that comprise the transportation occupational cluster.

Service Station Services 16 enables students to explore a major area of the transportation industry. Students demonstrating appropriate interests, attitudes, levels of participation and basic competencies should be encouraged to complete the service station services sequence and consider complementing it with one or more related course sequences (e.g, automotive services, warehouse services).

Students with particular adeptness and interest should be encouraged to enrol in the regular vocational automotives program.

INSTRUCTIONAL LOCATIONS AND FACILITIES

Schools already having an automotives program may wish to integrate teaching Service Station Services 16 in the automotives lab with the Vocational Automotives 12 course. Teachers are encouraged to establish and use community partnerships to provide students with on-the-job instruction, under a teacher's supervision, for the majority of the Service Station Services 26 course.

Basic equipment suggested for Service Station Services 16 include:

EQUIPMENT

- Air compressor
- Cooling system pressure tester kit
- Creepers
- Hoist
- Floor jack
- Gear oil pump
- Grease gun
- Impact wrench
- Oil drain mobile
- Power flusher
- Pressure washer
- Safety stands
- Time clock
- Tire balancer
- Tire changer
- Tire tank
- Trouble lights
- Vacuum cleaner
- Waste oil storage tank

TOOLS

- Adjustable wrenches
- Air lines and hoses
- Antifreeze hydrometer
- Battery cable clamp puller
- Battery filler jug
- Battery terminal brush (post cleaner)
- Drain pans
- Funnels
- Hammers
- Impact socket set
- Inspection mirror
- Oil filter wrench
- Pliers
- Punches and chisels set
- Ratchet and socket set
- Screwdriver set
- Tire air chuck
- Tire patch stitcher
- Tire plug rasp
- Tire plug installation tool

FUEL SALES EQUIPMENT

- Bulk fuel tanks
- Business forms
- Credit card imprinter
- Dipping stick
- Fuel pumps
- Tank charts
- Telephone

TOOLS

- Tire pressure gauge
- Valve core tool
- Valve stem tool
- Wheel weight pliers
- Wrench set

OTHER LEARNING RESOURCES

Barbarossa, Fred. *The Car Care Book* (1st Edition). South-Western Publishing, 1983.

Car Care Guide. Check Chart Division of H.M. Gousha Co., 1980.

Crouse, William. *Automotive Mechanics* (2nd Canadian Edition). McGraw-Hill Ryerson Limited, 1987. (Approved basic learning resource for automotives.)

Crouse, William. *Automotive Service Business* (1st Edition). McGraw-Hill Ryerson Limited, 1973.

Hoyt, Wade, and Ian Walter, ed. *Complete Car Care Manual* (1st Edition). The Readers' Digest Association, 1981.

Leaking Underground Storage Tanks. Environment Canada (Resource 2).

Management of Underground Petroleum Storage Inventory. The National Automotive Trades Association of Canada, (Resource 3).

Nash, Frederick C. *Automotive Technology* (3rd Edition). McGraw-Hill Ryerson Limited, 1986.

Stockel, Martin. *Auto Service and Repair* (3rd Edition). Goodheart-Wilcox, 1978.

Retail Gasoline Dealers Association of Nova Scotia. *Gasoline and Diesel Oil Meter and Dip Book*. Automotive Retailer Association (Alberta), (Resource 1).

Thiessen, Frank, and Davis Dales. *Automotive Principles and Service* (2nd Edition). Prentice-Hall Canada Inc., 1984. (Approved basic learning resource for automotives.)

TEACHER SUPPORT MATERIAL

WAREHOUSE SERVICES 16

COURSE SEQUENCE

Warehouse Services 16 is the introductory course in the Warehouse Services 16-26-36 sequence. This sequence is one of three occupational courses that comprise the transportation occupational cluster.

Warehouse Services 16 enables students to explore the warehousing and parts sales industry. Students demonstrating appropriate interests, attitudes, levels of participation and basic competencies should be encouraged to complete the warehouse services sequence and consider complementing it with one or more related course sequences (e.g., automotive services, service station services, business services).

INSTRUCTIONAL LOCATIONS AND FACILITIES

Schools already teaching an Automotive Parts Merchandising 15 program may wish to integrate teaching Warehouse Services 16 with the merchandising course. Where a lab is not available and/or where integration of students is not possible, two alternatives are suggested:

1. Use the school's receiving and stock control area, bookstore, cafeteria or automotives area.
2. Establish and use community partnerships to provide students with on-the-job instruction, under a teacher's supervision, for the majority of the Warehouse Services 16 course.

An automotives parts lab located adjacent to the automotives shop may be a suitable instructional environment. It provides a stockroom environment sufficiently authentic to instil a sense of responsibility in the students.

Basic equipment and tools suggested for an in-school parts/warehousing operation include:

- 1 bin section (8'x3'x1'), 12 compartments
- 1 shelving section 30"x 8'x 6'
- Basic hand and power tools
- Catalogues related to available stock
- Tub file with stock inventory cards
- Warehouse supply catalogues
- Fill material (newspaper, polystrene chips)
- Packaging tape
- Razor knife
- Selection of cardboard boxes
- Selection of used parts
- Selection of forms used in local warehouses

OTHER LEARNING RESOURCES

Ackerman, Kenneth B. *Practical Handbook of Warehousing* (2nd Edition). The Traffic Service Corporation, Washington, 1986.

Briggs, Andrew J. *Warehouse Operations, Planning and Management* (2nd Edition). John Wiley and Sons, New York, 1960.

Eastman, Robert M. *Materials Handling*. Marcel Dekker Inc., New York, 1987.

Hilgenberg, Gene, and Jane Huston. *Employment in Agribusiness*. Mid-American Vocational Curriculum Consortium, Stillwater, Oklahoma, 1984.

Kulwiec, Raymond A., ed. *Materials Handling Handbook* (2nd Edition). John Wiley and Sons, New York, 1985.

Other references may include:

Telephone Advertising Directories (e.g., Yellow Pages/Purple Pages)
Warehousing and Supply House Catalogues.

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